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Jan-June 1922

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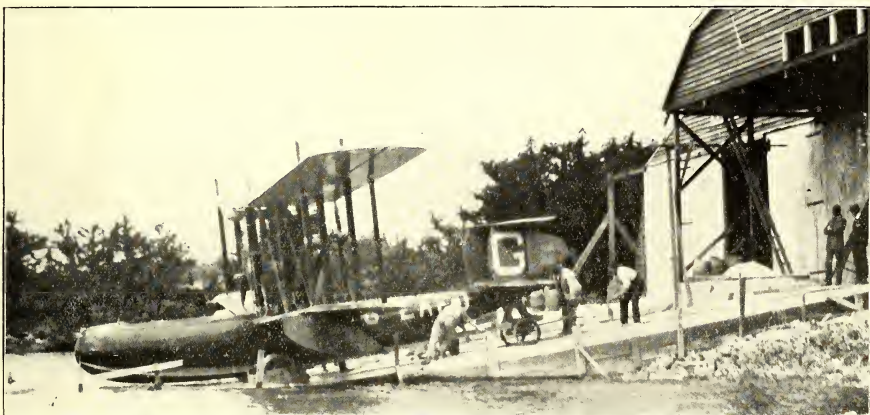
Edited by  
C. C. Grey

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SIXPENCE WEEKLY.

[Registered at the G.P.O.  
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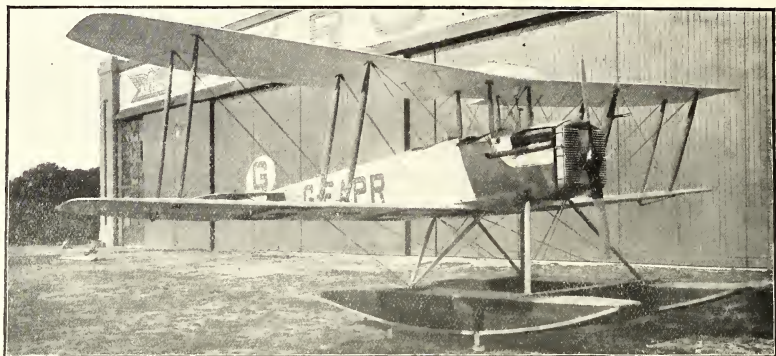
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## ON 1921.

In aviation things always seem to go by contraries. At 23.59 hours on Dec. 31st one stood among a group of people who solemnly consigned 1921 to eternal damnation as the worst year on record for all businesses known to them and proceeded thereafter to hail 1922 with joy and appropriate libations on the assumption that it could not possibly be worse than 1921. Yet, as a matter of fact, so far as aviation is concerned 1921 has been quite a good year. At any rate it has been far better than the aeronautical community as a whole has deserved.

### The R.A.F. in 1921.

Take the most important part of British Aviation first, the R.A.F. Compare the R.A.F. to-day with the R.A.F. of 1919 and 1920. It is an entirely different Service. The wedding-process is almost complete. The officers are rising to the level of their responsibilities as the leaders of our first line of defence. The men are noticeably superior to those of the Senior Services.

Apropos which there is a story which must be told. A certain senior officer of the R.A.F. was being interrogated by a high official of the Cabinet on the subject of effecting economies in the R.A.F. The official suggested that over much money was being spent on the training of other ranks in the R.A.F. The officer pointed out that in the nature of the R.A.F.'s work every man in the Air Force had to be a highly educated, highly trained craftsman. "But," objected the official, "do you mean to say that all these men I see walking about looking like soldiers are skilled craftsmen?" The officer regarded him reproachfully for a moment and replied, "Don't tell me that you have seen any of our people looking like soldiers!"

That reply expresses very well the spirit which has sprung up in the R.A.F. during 1921. Very soon the most cutting criticism an R.A.F. drill instructor will be able to make on a bad parade will be to tell the officers and men that they look like soldiers, much as the Army tells its people that they march like "grabbies."

And it is noted, this smartness of the personnel is but the outward and visible sign of an inward and technical grace, for the men are becoming as good in the work-hops as they are on parade. Formerly the best mechanics in the Flying Services came from the motor trade. Now an indifferent craftsman in the R.A.F. is told that he is only fit for the motor trade. Thus do we rise from our dead selves to higher things.

Another gift of 1921 to the R.A.F. has been the handing over of the control of Mesopotamia which is the first step towards the Government's recognition of the R.A.F. as the First Line of Defence of the British Empire. This has been accompanied by various important changes in the different Commands, all of which are wholly commendable and will still further increase the efficiency of the R.A.F. and hasten its final development as the King's Premier Service.

Furthermore, during 1921 the Directorate of Research has been quietly working at specifications for new aeroplanes for the R.A.F., which specifications have produced from our aircraft constructors some most remarkable designs. Many of these new designs have been ordered from the constructors and such of them as have been delivered have proved that when the selected machines are put into production and delivered the R.A.F. will be better mounted than any air force in the World.

Similarly the Directorate of Research has encouraged the designers of aero-engines, so that to-day we have in this country several engines superior to those in any other country. Also we have new types coming along which are in their turn equally superior to those already in use.

Thus the year 1921 has laid the foundations of an air force which in smartness, moral, esprit de corps, technical skill and equipment of matériel is unequalled by any other country. Certainly the R.A.F. has no cause to quarrel with 1921.

### The Trade in 1921.

The Aircraft Industry likewise has much for which to be thankful. One has already referred to the encouragement given to new designs by the Directorate of Research. The

system by which constructors are asked for designs to fulfil certain specified performances and are given experimental orders for sample machines has kept the designing staffs and a nucleus crew of specially skilled mechanics quite busy in practically every aircraft factory worthy of the name—with perhaps one or two notable exceptions which really call for some explanation from those in authority, especially in view of the fact that one of these firms has produced the fastest aeroplane in the World, for the first time in the history of British Aviation.

The Department of Research has even gone to the length of ordering experimental civil air transport machines canonised as war machines so as to help Civil Aviation when the English shopkeeper awakes to the possibilities of aircraft in connection with his nefarious calling. The result has been the development of several highly promising passenger-carriers which ought to do good work this year if the Department of Civil Aviation is allowed to exist by the Geddes axe and if it awakes to a sense of what one can do when one wants to and if one tries.

All this has produced a certain activity in the Trade which has been lacking in practically every other industry in Great Britain. Also it is worthy of note that in one period of three months the official returns showed that the exports of aircraft and material were the only class which showed an increase for the period under review. This was doubtless due to some extent to the export of "disposals" war machines, but even this entailed a vast amount of employment of labour in reconstructing machines, altering war types to civil requirements, overhauling, tuning and testing. Also the exports included quite a fair proportion of new aeroplanes, engines, and spare parts. So altogether the Trade has no reason to regard 1921 with animosity.

### Civil Aviation in 1921.

When one comes to consider Civil Aviation one regards 1921 with mixed feelings, for though much has been done so very much more has been left undone that ought to have been done. It is true that our air lines have carried many more passengers than in the previous year and that our British machines have carried a much higher average of passengers than have the French and Dutch and Belgian machines and that we have not had a single serious accident and that our pilots have flown when no other pilots have flown and that our mechanics have assured wonderful freedom from breakdowns. But for practical purposes the ground organisation of the London-Paris route is no better than it was in 1920, and the Department of Civil Aviation has shown lamentable weakness in allowing itself to be persuaded into paying over-generous subsidies when it ought to have spent the money on new and improved aeroplanes and engines.

On the other hand that sub-department which deals with aerodromes and licences has done splendid work. It has provided at Croydon the best organised civil aerodrome in the World. It has assured the airworthiness of civilian aeroplanes so that we have had complete freedom from accidents not only on the regular air lines but among "joy-ride" concerns. And it has assisted this excellent result by insisting rigorously yet with good judgment on the competence of pilots and mechanics, allowing due latitude where it should be allowed and keeping a firm hand where desirable.

In consequence of all this not one passenger's life was lost in British Civil Aviation during 1921.

The result is that to-day a British certificate for man or machine stands as high in the estimation of the World as does an A1 at Lloyd's certificate among shipping people. Certainly in this respect 1921 has done well for Civil Aviation.

Air Mails as between London and Paris have been proved a failure. But the air mail-line run by the R.A.F. between Cairo and Baghdad has proved the very high value of air transport when instituted between suitable points and run by competent people. The lessons to be learned in both directions are all to the good, and for those lessons we have to thank 1921.

### Sport in 1921.

Even the Sport of Flying owes much to 1921. The R.A.F. Pageant, which may fairly be included among sports, showed

in 1920 that the British Public is interested in flying, and the Pageants at Hendon, Hawkinge, Andover and Cairo in 1921 proved that the interest is increasing. The Aerial Derby of 1921 confirmed this fact and its excellent organisation showed for the first time that the Royal Aero Club is awaking from its lethargy and is capable of great things.

Furthermore the sporting little meeting organised by the Club at Croydon in the Autumn, in the worst possible weather, showed what can be done there and how the Public will support bigger efforts in the coming year. This demonstration is perhaps the best gift of 1921 to the Sport of Flying. Also the Club's initiative in promoting (and bearing all the expense of) an Oxford and Cambridge air race is a distinct score. And the Club's enterprise in providing aeroplanes for members at £3 per hour is distinctly a step in the right direction. In fact, 1921 has saved the reputation of the Royal Aero Club and has shown that there are possibilities in the Sport of Flying.

In his own section of this paper Captain Sayers has dealt with the more scientific aspects of 1921. He also shows that the dead year has not been by any means so bad as it has been painted.

### "The Aeroplane" in 1921.

So far as THE AEROPLANE and its staff is concerned, we all have much for which to thank 1921. The aircraft and aero-engine firms have supported us generously, as have certain firms to which aviation is only a side-line. For this support we are duly grateful and one hopes and believes that such

firms have had full value for the support they have given us. The staff of this paper, like oneself, never forgets a kindness or forgets an injury, and those who have helped us through the difficulties of the past year may rest assured that when opportunity offers their acts will be duly rewarded so far as lies within our power.

THE AEROPLANE as a newspaper owes much to 1921. The bad times have weeded out all competitors except one, for which and for whose staff one has the highest esteem and regard. Long may our old friends of *Flight* continue in friendly rivalry with THE AEROPLANE, and may we both, when good times come again, advance in prosperity together.

Meantime THE AEROPLANE has every reason to be satisfied with its progress in 1921. Its influence among those who matter has never been so great as it is to-day, as is proved by the information, enquiries, and arguments which arrive day by day from every class of the aeronautical community and from all parts of the World. The special tri-lingual issues, produced as a counter-blast to the Paris Aero-Show, have in particular produced cordial felicitations from foreign nations.

Finally one wishes to acknowledge to 1921 the acquisition after a process of elimination of the most intelligent, cheerful, hard-working, enthusiastic and, incidentally, long-suffering staff with which one has ever had the pleasure of co-operating.

So, in wishing all readers of this paper a Happier New Year in 1922, one is far from looking back on 1921 as a thing of evil.—C. G. G.

## THE REVIEW OF THE YEAR.

### JANUARY.

**SERVICE AERONAUTICS.**—The first important event of January was the approval of the R.A.F. ensign by His Majesty the King. This ensign consists of an R.A.F. blue flag with the Union Jack on the inner top corner and the red, white and blue tacket which is used as an identification mark on R.A.F. machines in the middle.

On Jan. 17th it was noted that H.M.S. *Argus* aircraft ship was cruising in the Atlantic fleet on manoeuvres.

On Jan. 19th it was recorded that H.M.S. *Campania*, an old Cunarder used as an aircraft ship during the War, and sunk at Scapa in a collision, was to be blown up.

On Jan. 26th it was noted that awards to inventors of aeronautical war material already amounted to £177,500.

**CIVIL AVIATION.**—Sir William Beardmore, head of the firm of William Beardmore and Co. Ltd., was created a Baron in the New Year's Honours.

On Jan. 8th it was announced that subsidies for air lines would be granted to a maximum amount of £60,000. The basis on which this was to be granted was 25 per cent. on the gross revenue of each firm and it was provided that the line should run on 45 days in each three months in order to qualify for subsidy and that no flight to Paris exceeding 4 hours should qualify.

The Iustone Air Line had ceased to run machines to Paris in December, and Handley Page Transport Ltd. were only running two or three machines a week.

In January Major-General E. D. Swinton, C.B., D.S.O., Director of Information at the Air Ministry, resigned and no fresh appointment has been made to his post.

On Jan. 11th a petition came before the Court for the winding up of Martinsyde Ltd., one of the pioneer firms of British Aviation.

On Jan. 20th a new firm called Air Express Ltd. was registered by Mr. D. Greig, who had previously been connected with Air Transport and Travel Ltd. deceased.

**OVERSEAS DOMINIONS.**—Col. Brinsmead was appointed Controller of Civil Flying in Australia and Maj. P. E. Coleman was appointed Secretary to the Australian Air Council.

A number of Government aeroplanes presented to the Dominion of New Zealand by the Air Ministry were handed over to the Canterbury Aviation Co. to be stored. Some of these were afterwards converted to civilian use.

It was recorded that an Air Board had been appointed for South Africa late in the previous year, the Chairman being Sir W. W. Hoy, of the Railways and Harbours Board.

Experiences in whale spotting off the Cape of Good Hope were published during January.

**FOREIGN AERONAUTICS.**—It was recorded that during December the Wright Aeronautical Corporation obtained in the U.S. Courts an injunction against Handley Page Ltd. and the Aircraft Disposal Co. Ltd. to restrain them from selling British disposals aeroplanes in the States.

On Jan. 15th M. Laurent Eynac replaced M. Flandin as Under-Secretary for Air in the French Government.

It was noted on Jan. 26th that the Dutch Government had bought 60 German Heinecke parachutes for use by the Dutch Air Force.

On Jan. 26th it was noted that a report of the U.S.A. Direc-

tor of Air Services had been issued. In the U.S.A. 25,840,197 dollars had been voted for aviation in 1919-1920. The U.S. Army Air Service showed at Jan. 1920, 54,040 pilots, 2,293 other officers, 8,420 other ranks and 8,155 civilians.

On Jan. 26th particulars were published of the Katterl-Lachmann Wing which had been patented in Germany and set forth claims similar to those made for the Handley Page Wing in this country.

On Jan. 17th it was recorded that the Italian Government had taken over 12 fast Savoia flying boats for the Italian Navy.

### FEBRUARY.

**SERVICE AERONAUTICS.**—On Feb. and a leader on "Big Ships and Aircraft" dealt with certain admirals who had been participating in newspaper controversies.

On Feb. 9th it was noted that the Admiralty were asking for lieutenants R.N. of 1918 to volunteer for a course as aeroplane observers. A number of these officers were subsequently put through an observer's course at Gosport by the Fleet Co-operation Squadron of the R.A.F. Coastal Area. This was only a step towards making the R.A.F. pilot on board ship merely an engine-driver.

It was also noted on Feb. 9th that H.M. Airship R.33 had been demobilised and allotted the lettering G-FAAG as a civil airship for use in experiments with mooring masts.

On Feb. 13th Major-Gen. Sir J. Davidson in the House of Commons moved an Amendment to the Address, advocating the establishment of a Ministry of Defence with Under-Secretaries for the Navy, Army, and Air Force. This Amendment was seconded by Lieut.-Gen. Sir A. Hunter-Weston. Nothing further was done about it up to the end of the year, though the violent opposition to the idea which appeared in some papers in December gives colour to the belief that the Geddes Committee has recommended the formation of a Ministry of Defence.

On Feb. 16th it was stated that Mr. Churchill had left the Air Ministry. His official appointment to the Colonial Office in control of the Middle East was notified later. He was succeeded as Air Minister by Capt. the Hon. Frederick Guest. Subsequently also Lord Londonderry, Under-Secretary of State for Air, left the Air Ministry to participate in the Government of Ulster, and was succeeded by Lord Gorell.

On Feb. 25th Air Marshal Sir Hugh Trenchard, Chief of the Air Staff, was appointed Chief Air Aide-de-Camp to the King.

**CIVIL AVIATION.**—The first appearance of the amphibian Vickers "Viking IV" was recorded in THE AEROPLANE on Feb. 2nd. Also in that issue was recorded experiments with the Georges Avelines automatic control on a Handley Page, this control consisting of a mercury level operating electric servo-motors.

The first appearance of the 1,000-h.p. Napier "Cub" engine was recorded on that date.

The completion of the airship R.36 at Beardmores was also recorded.

On Feb. 9th the D.H.14 (Rolls-Royce "Condor" engine), a long-range heavy bomber, and practically the first post-bellum war machine, was illustrated.

It was recorded that though not a single British aeroplane crossed the Channel during the week ending Feb. 6th, chas-





attitude showed an interesting resemblance to the mental outlook of the British workman who objects to piece-work.

On Mar. 10th it was noted that owing to the cut in the air fares between Paris and London from the equivalent of ten guineas to the equivalent of £6 (300 francs) the French air line machines were carrying full loads and that no British machines were being used.

On Mar. 17th the Air Ministry announced an agreement with the aircraft traders as to the resumption of the British air lines. The first machine to cross the Channel was a Handley Page on Mar. 19th and the first Instone air liner followed on Mar. 21st.

On Mar. 23rd the new Vickers "Vimy" ambulance, Napier engines, was illustrated in this paper.

It was also noted on that date that R.36 had been completed and allotted the civilian letter G-FAAF.

On Mar. 30th the R.36 was described and on the same date the new type 21 Fairey amphibian fleet spotter, Napier engine, was illustrated for the first time.

**OVERSEAS DOMINIANS.**—On Mar. 10th a leading article in this paper described the activities of the Canadian Air Board and the energetic steps being taken by that body to promote the progress of aviation in Canada.

**FOREIGN AERONAUTICS.**—On Mar. 2nd there appeared in this paper the first of several articles in which the part to be played by aeronautics in the inevitable war between America and Japan was foretold.

It was recorded on Mar. 2nd that the U.S. Army had bought the Italian semi-rigid airship T.34 ("Roma") for 200,000 dollars.

On Mar. 16th the immense Caproni triple hydro-triplane was illustrated.

Also on that date it was recorded that Japanese aircraft had been employed in Formosa in subduing the local head hunters.

It was also noted that a British mission organised by Col. the Master of Sempill, and including Col. Mears and Majors Fowler and Brackley, all late R.A.F., were going to Japan to teach the Japanese Navy how to fly.

On Mar. 23rd it was reported that the King and Queen of Belgium had accepted from the Belgian Army the rank of military aviators.

On Mar. 23rd was published a resumé of United States aerial developments during 1920.

On Mar. 23rd that the River Plate Aviation Co. in Argentina had carried between January and June, 1920, 2,293 passengers and covered 45,600 miles with 8 pilots.

On Mar. 30th a resumé was published of the lecture delivered by Grp/Capt. Holt at Shanghai on Jan. 18th.

On Mar. 30th it was also noted that quite a considerable business was being done in smuggling opium into China by flying boats from the Portuguese possessions of Macao.

## APRIL.

**SERVICE AERONAUTICS.**—It was noted on April 6th that a survey party of the R.A.F. was operating between Ramleh in Palestine and Baghdad. Later on it became known that this party, under Colonel Fellowes, consisted of armed but not armoured cars assisted by aeroplanes, and that it had successfully surveyed a definite route across the desert to Baghdad, which was subsequently marked out as a permanent air line to the East.

On April 8th the Air Ministry issued a notice asking former pilots of the R.A.F. to volunteer for strike duty against the Triple Alliance (Miners, Transport Workers and Railway Workers) which threatened a general strike. Far more pilots volunteered than could possibly be used.

An Air Ministry Appropriation Account was issued on April 16th.

**CIVIL AVIATION.**—On April 1st took place the first tests of the airship R.36 (G-FAAF).

On April 12th the first Fokker monoplane (Siddley "Puma" engine) to be used for regular air-line work arrived at Croydon, piloted by Mr. Olive. This was the opening of the K.L.M. (Koninklijke Luftvaart Maatschappij) Line.

On April 12th the Wilbur Wright Memorial lecture was delivered by Mr. G. I. Taylor, F.R.S., on "Scientific Methods in Aeronautics."

In *THE AEROPLANE* on April 13th Capt. W. H. Sayers published a lucid article demonstrating that air traffic ought to pay if properly managed.

On April 26th a firm named National Air Transport Ltd. was registered, but up to the present no developments have taken place.

During April the Berkshire Aviation Company celebrated its second anniversary. Under the skilful management of Messrs. J. D. V. Holmes and J. C. C. Taylor this firm during its two years of existence carried 18,000 passengers over a distance of 100,000 miles with two Avro aeroplanes, each seating two passengers as well as the pilot, all without accident. Subsequently two new firms with two more aeroplanes

and with several extra pilots and engineers started out as the "Berkshire Aviation Tours" as offshoots of the Berkshire Aviation Co., though in no way connected with it financially. Each of these run respectively by Mr. Fred Holmes and Mr. O. P. Jones has done very well.

**OVERSEAS DOMINIANS.**—On April 20th there appeared in *THE AEROPLANE* the announcement that Mr. Bert Hinkler, previously famous for his flight from London to Turin non-stop on an Avro "Baby," had flown from Sydney to Bundaberg, a distance of 800 miles, in 9 hours, also on an Avro "Baby" with the same 35-h.p. Green engine which had carried him to Turin and back.

**FOREIGN AERONAUTICS.**—On April 3rd the Monaco Meeting began and proved to be a complete wash-out.

On April 6th it was noted that exploration for oil in Venezuela was being carried out by Supermarine flying-boats operated by the Bermuda and West Atlantic Aviation Co. Ltd.

On April 16th the first British instructors to the Japanese Naval Air Service arrived in Yokohama.

On April 27th the Petroczy helicopter, the only successful machine of its kind, was described in this paper.

## MAY.

**SERVICE AERONAUTICS.**—Nothing of note occurred during May beyond the fact that at Kenley on May 16th, and later at Farnborough, a demonstration of flying was given by R.A.F. pilots before the Crown Prince of Japan and his staff, who appeared to be duly impressed.

**CIVIL AVIATION.**—On May 17th there was described in *THE AEROPLANE* the Auston Life-Raft, an apparatus which should be of very considerable importance to air liners operating over sea.

On May 18th Captain Sayers published in *THE AEROPLANE* an important article demonstrating the qualities and possibilities of variable wings.

On May 30th Sir Frederick Sykes announced that unless financial support were forthcoming from commercial sources the whole of the airships would be demobilised and the airship personnel discharged or distributed to other branches of the R.A.F.

**OVERSEAS DOMINIANS.**—It was noted on May 6th that Colonel Sir Helerpus Van Ryneveld had been appointed to be Director of Air Services in the South African Commonwealth.

## JUNE.

**SERVICE AERONAUTICS.**—On June 22nd the Independent Force Annual Dinner took place, with Sir Hugh Trenchard in the Chair, Captain Guest as the guest of the evening and the Duke of York present as an ex-officer of the Independent Force, R.A.F. Sir Hugh delivered a short address on the good work of the R.A.F. during the past year and its excellent prospects.

On June 22nd it was noted that Rear Admiral Murray Smetter, formerly Director of the Air Department, Admiralty, and founder of the Royal Naval Air Service, had entered the House of Commons as a member of the Group favoured by Mr. Horatio Bottomley, a fact on which condolences were duly proffered to that distinguished officer.

On June 30th Wing/Chndr. H.R.H. the Duke of York was promoted to Grp/Capt. in the R.A.F.

On June 30th the first official flight was made over the Desert Route. Three R.A.F. machines left Baghdad at 04.30 and reached Cairo at 19.45 the same day.

**CIVIL AVIATION.**—On June 1st airship G-FAAG, otherwise R.33, was used to patrol the roads leading to Epsom, this being Derby Day.

Throughout June, generally, there was much agitation in the Press, especially the Northcliffe Press, in favour of discovering somebody who would put up the money necessary to save the operating airships from being shut down. The commercial community remained unmoved by these appeals and some representatives of the Overseas Dominions still seem to have hope, in that addresses and speeches on the subject still took place in November.

On June 8th there took place the tenth birthday of *THE AEROPLANE* newspaper, an event on which a number of congratulations were received from all parts of the World.

On the same day, but without any connection with the foregoing, Mr. H. White Smith, Chairman of the Society of British Aircraft Constructors, and Mr. Samuel Instone, of the Instone Air Line, were made Knights of the Order of the British Empire.

The report of the Safety and Economy Committee appointed by the Air Ministry was issued on June 13th without any evident result up to the end of the year.

On June 15th there were published in this paper details of R.38, 2,700,000 cubic feet capacity, the World's largest airship.

On June 15th the official notice of the terms to be offered to air lines was issued. The total amount to be offered in subsidies beginning from the financial year opening on April 1st, 1922, was set at £200,000 per annum for three years, strictly on a system of payment by results. Later, as usual,

(Continued on page 15.)

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chandises. Constructeurs des  
Fairey Type III. Série de machines  
fournies en grandes quantités au  
Gouvernement Britannique pen-  
dant la guerre et depuis la cessa-  
tion des hostilités. Dans cette  
série de machines, le fuselage, le  
plan central et la queue, etc., sont  
de type normal, et sont construits  
de manière à pouvoir recevoir des  
ailes de types différents, ainsi que  
des châssis et moteurs d'autres  
machines de la série, de manière  
à être appropriés à l'usage auquel  
la machine est destinée dans  
chaque cas particulier. Toutes les  
machines de cette série ont des  
ailes démontables et repliables et  
sont munies de notre dispositif  
breveté de cambrure variable, qui  
permet les plus grandes perfor-  
mances et qui combine une grande  
puissance de soulèvement avec une  
faible vitesse d'atterrissage.Proveedores del Almirantazgo,  
Departamento de Guerra y  
Ministerio de Aviación Británicos.Únicos poseedores de la patente Fairey  
de dispositivos de conbco variable para  
aeroplanos, hidroaviones y barcos aéreos.Diseñadores y constructores de  
hidroaviones, barcos aéreos, aéro-  
planos, aparatos anfíbios, de todas  
clases, también de aparatos espe-  
cialmente adecuados para el  
levantamiento de cartas topográ-  
ficas y fotografías, hangares flo-  
tantes y completo equipo para  
estos mismos.Diseñadores, por orden especial  
del Gobierno Británico del barco  
aéreo más grande que se ha con-  
struido para este gobierno.Proveedores de todo lo necesario  
para servicios de transporte aéreo  
de pasajeros, correos y mercancías.Diseñadores y constructores del  
tipo Fairey III. Serie de aparatos  
suministrados en grandes can-  
tidades al Gobierno Británico,  
durante la guerra y después  
de su terminación. En esta  
serie de aparatos, el fuselage,  
el plano central y la unidad  
de la cola, son de tipo normal y  
fabricados para adaptarse a dife-  
rentes tipos de alas, chassis y  
motores de otros aparatos de serie  
que sean adecuadas para los fines  
particulares a que se destina el  
aparato en cada caso. Todas  
las máquinas de este tipo,  
tienen alas plegadizas y están  
provistas del dispositivo patentado  
de conbco variable Fairey que da  
una alta capacidad y potencia de  
ascensión combinada con una  
velocidad baja de aterrizaje.



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This Form must accompany any inquiry respecting this Telegram.

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# AERONAUTICAL ENGINEERING

SUPPLEMENT TO "THE AEROPLANE"

INCORPORATING AIRCRAFT ENGINEERING, AERODYNAMICS, AIRCRAFT FINANCE AND COMMERCIAL AERONAUTICS AND MATTERS PERTAINING TO THE AERONAUTICAL ENGINEER AND THE AIRCRAFT TRADER.

## THE WEEKLY COMMENTARY.

In accordance with custom some reflections on the past year's progress are published below.

In a transcription of a communication received from a German correspondent there will be found a considerable amount of interesting information as to the aims and objects of the German soaring experimenters. It will be noted that their hopes of the practical utility of soaring aircraft are very closely in accord with the views already expressed in this journal.

There is in addition an extremely interesting account of the theory of piloting a soaring aircraft in order to

make use of the energy of a gusty wind. There is no doubt that the method suggested, if it can be practised with reasonable certainty, will produce soaring flight.

But it is somewhat difficult to believe that a pilot can learn to anticipate the variations of a gusty wind with the accuracy necessary to give the desired result, and it seems probable that some explanation other than that here advanced must be sought for the known achievements of Herren Klemperer, Köller, and Harth.

Dr. Ing. Rumlper, in a letter, replies to a criticism of the design of his 1,000-h.p. aero engine which was made in this paper.

## 1921.

By W. H. SAYERS, Technical Editor, THE AEROPLANE.

To review, on the first of January, the events of the preceding year, and to attempt to estimate the progress which has been made in that year, is in many ways an unwise undertaking. To secure some approach to a proper sense of perspective, one should choose on that day to review the events of some more distant period, but unfortunately journalism is concerned with current events, not with critical historical research, and custom demands that the risk be taken.

[Be it understood that no Editorial coercion was exercised on the Technical Editor to produce these reflections.—C. G. G.]

On the whole, 1921, in so far as Aviation is concerned, may be considered to have been a satisfactorily disappointing year. Satisfactory in that it has been a year marked by much activity of the type which promises to lead to advance in the future, disappointing because it has been relatively poor in remarkable achievement.

Regarding the realms of achievement, there is to be recorded during 1921 the very satisfactory operation of the passenger carrying air services.

Very greatly helped by the phenomenal weather of last year, the European air services carried an astonishingly large number of passengers, and carried them with a remarkably small number of untoward occurrences. It is perfectly true that for this work these services have been supported by subsidies from the Governments of the country of their origin, and that even so certain of their proprietors loudly proclaim that passenger carrying does not pay.

There is no particular reason why it should pay under the conditions of operation at present usual. It is perhaps unkind, but not entirely unjust to remark that one wishes that it were true that it did not pay. But, taking into account the relatively unsuitable equipment of all organised air lines, the fact that those now existing should have done as much work as they have done in the past year may still be considered as a proof that with proper equipment air services can be operated safely, regularly, and—eventually—at a profit.

As to promise, 1921 has produced, either on the drawing boards of the designers, or in the works of the manufacturers, quite a number of new aircraft, whose qualities and features

are marked by signs of a growing appreciation of the real requirements of commercial aviation. None of these machines has yet shown its worth in the ultimate testing station of regular operation, and by this time next year their merits may be fairly accurately known, but undoubtedly one may look for distinct advances in economy of operation—so far as machines are concerned—during the coming Summer.

In this matter one may feel fairly secure in believing that the British Aircraft designers will maintain their predominance over their rivals of other nations. It is true that Britain cannot show so many strange and novel designs of the 1921 vintage as can some of her rivals, but 1922 should show more valuable new types of commercial aircraft of British origin than of any other nationality.

But there is even more of promise in certain signs and portents, scarcely visible as yet, but nevertheless just discoverable to those who can look below the surface. There is abroad to-day a certain broad discontent, a certain loss of faith in the pronouncements of the wise and the learned. Even the last report of the National Advisory Committee for Aeronautics lacked something of the usual self-assurance, the first report of the Aeronautical Research Committee indicated the dawning of a realisation of incomplete knowledge.

It is really beginning to dawn on the most profound of our aeronautical pundits that they know very little about aerodynamics, that R.A.F. 15 is not the best of all wings for all possible purposes, that scale corrections are not quite the simple affairs that they were once thought to be, and that in fact there are still possibilities of putting up the performance of aeroplanes by means other than those of increasing the power-weight ratio.

In fact, after ten years of building tractor biplanes to a nearly standardised outline and to nearly standardised proportions, it is beginning to be believed that there may be other shapes wherein one may make satisfactory aeroplanes.

It is perfectly true that with a few possible, but not yet proved, exceptions, nobody has built any aeroplane better than this standardised type. It is perfectly possible that no one ever will. Nevertheless the fact that the aerodynamical world is markedly less satisfied with its own knowledge of aerodynamics to-day than it was three years ago is probably the most promising symptom which 1921 has revealed.

## A GERMAN VIEW OF SOARING FLIGHT.

The articles on "Soaring in Practice," which appeared in this paper on Oct. 19th and 26th, have attracted the attention of a German correspondent who is deeply interested in this subject, and who has been moved to put into writing the German views on the subject.

In the first place he regards experimental work on this subject as being a contribution to the human knowledge of natural phenomena, and as therefore of international scientific interest demanding the collaboration of all civilised nations.

Although as he points out it is well in matters of this kind never to say "never," there is no belief amongst the German workers on this subject that soaring machines will ever be directly useful, either for commercial or for war purposes, and, apropos the fact that the Inter-Allied Aeronautical Commission appears to regard the German soaring machines as being sufficiently important to be brought under the general ban on German aircraft construction, this correspondent invites those who think otherwise to try an aerial combat between such a machine and any normal fighting type.

In the matter of the value of such craft, German opinion agrees fairly closely with the views put forward in the articles before mentioned. The aims in view are:

(1) The development of small sporting type machines, whether they be soarers fitted with auxiliary engines or frankly engine-driven machines of improved efficiency, and therefore very low power developed from the experience gained with the gliders,

(2) The development of new methods of light construction which should be specially applicable to a machine of the type referred to in (1) but also to more powerful types.

(3) The educational value of the work done as tending to improve aeronautical construction generally in the direction of higher efficiency (i.e., high L/D values for complete aeroplanes).

Further it is pointed out that soaring flight requires a study of meteorological conditions, and that such study will directly advance the general knowledge of that subject—and therefore will aid the development of aviation generally.

The value of the glider as a full-size experimental apparatus—as opposed to the wind tunnel model—is also insisted upon and in particular the cheapness of this form of test is remarked.

Finally the sporting side of the question is touched on, and it is stated that soaring represents the finest possible sport, even more interesting and exciting than aerial fighting in high-powered aeroplanes, particularly in that so much depends on the pilot and so little on his machine, and at the same time one which serves a useful scientific end.

Referring to the practical possibilities opened up by recent developments, the plight of the German wartime pilots who desire to continue flying is noted. Even when the present embargo on flying is raised the cost of normal machines will prohibit sporting flying to any extent, and the development of 4 to 5 h.p. machines based on soaring craft will, it is hoped, remove this difficulty. In this respect the general estimates of what might be done which were given in this paper are confirmed, but at the moment even 5 h.p. aeroplanes are under a ban, according to the latest edicts of the Inter-Allied Commission, and a number of experiments in this direction which were under way have perforce been abandoned.

By way of example the following figures are given as typical of what is now possible according to the experimental results already obtained:—

### PARTICULARS OF AUXILIARY-ENGINED GLIDERS.

	Single Seater	Two-Seater	Three-Seater
Type	Cantilever Monoplane		
Material	Timber	Timber	Timber and Duralumin
Undercarriage	Skids Aachen type	Skids Aachen type	Rotary footballs Hannover type
Total weight	150 kg.	250 kg.	350 kg.
Surface	15 sq. m.	250 sq. m.	30 sq. m.
Engine h.p.	5-8 h.p.	12-18 h.p.	25-35 h.p.
Landing run	3 m.	10 m.	20 m.

Using the method of launching described by Mr. Handley Page and generally used by the German gliders, with the assistance of their engines these machines should be able to get off in a very few yards and to land in at most 15 metres. Skid undercarriages of the type used on Klemperer's "Aachen" gliders would be satisfactory for the two smaller types, and the Hannover arrangement of objects resembling footballs rotatable around axes passing through them for the larger three-seater.

Only very small areas are needed for getting off and

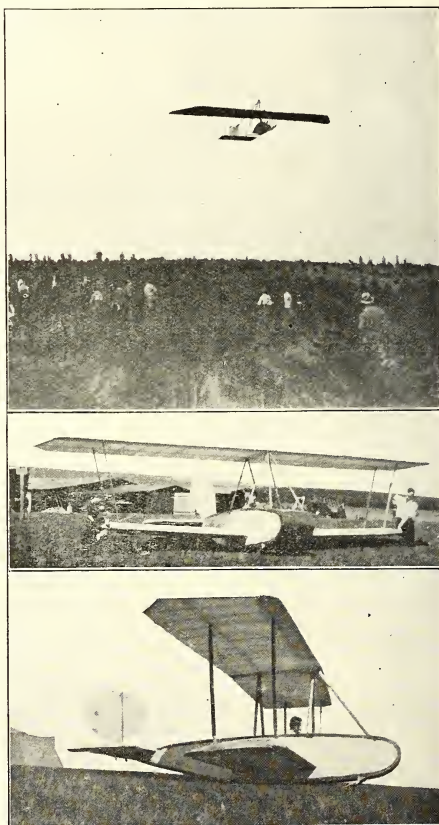
alighting, a very important factor from the point of view of the sporting owner-pilot.

Considering the results attained by the Klemperer (Aachen) and Hannover machines it is not believed that very much remains to be done in improving the "finesse" (gliding angle) of machines of similar size. But for auxiliary-engined machines flight at the lowest possible speed for landing, at the least expenditure of power when depending on the engine, and at the best possible gliding angle when soaring are all desired in the same machine, and there is still work to be done in combining these slightly differing requirements. It is suggested that experiments with variable camber wings and with the Handley Page type of wing would be of distinct interest for this purpose.

Finally the practical side of soaring flight is considered.

German experience has shown very clearly that success in soaring flight is in the first place a matter of piloting, and of a suitable wind, and only in the second degree of the qualities of the machine. Bad piloting, even with an excellent machine and the best possible wind conditions has never yet produced satisfactory soaring. Equally the best handling of the best machine yet produced has not yet given soaring flight in an unsuitable wind.

It is essential that at the same time one should have the three indispensable conditions of (i): A suitable wind, whose internal energy suffices to produce gliding; (ii) Piloting sufficiently skilful to utilise this internal wind energy; and (iii)



MORE GERMAN GLIDERS.—At the top, Herr Koller soaring over nearly level ground. Below, two views of the Hannover biplane, one of the few double-deckers which appeared at the 1921 Rhön Competition.

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The first to make a direct flight across the Atlantic.  
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## THE FUTURE OF FLYING DEPENDS ON RELIABILITY.

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A machine of really low resistance and, very particularly, of high manoeuvring qualities.

As to the wind there are three types which render soaring possible: (i) Winds with vertical components due to the slope of the ground; (ii) Gusts in a horizontal or mainly horizontal wind; and (iii) Winds of varying direction at varying altitudes.

"Soaring" in a vertical wind should not properly be described as soaring. It is really only gliding flight in a vertical wind. Aerodynamically and mechanically such flight is identical with ordinary gliding flight with the sole difference that the wind has a vertical velocity, and to call it "soaring" is to utter an untruth. To be honest, this method of keeping one's height will never lead to true soaring, and its only value seems to be that of giving experience in pilotage and aiding the development of the machines.

True soaring flight, which is the objective of the present German experiments, is flight by the use of the energy of a gusty wind, generally horizontal. Klemperer's 13½ minutes' flight, Marten's 15½ minutes' flight and Harth's 2½ minutes' flight have it is claimed been generally of this type. Klemperer's and Harth's flights were actually combinations of this type of flight and of ordinary gliding. The perfect type of soaring flight is characterised by the fact that it may take place over horizontal or practically horizontal ground (see the photo of Köller on the München monoplane).

As to the actual piloting needed for such flight, it sounds perfectly simple. It is in fact not simple at all. The apparent simplicity thereof is as follows:—

Variations in wind speed, in the form of gusts, represent energy available for soaring. If one can succeed by any manoeuvres whatever in reducing the variation of the wind, that is, if one can make the wind speed more nearly constant, then one will necessarily set free some of the internal energy. This energy, then, must take up a new form—as, for instance, heat or a vertical air velocity.

From this simple consideration one arrives at the equally simple theory of pilotage. One must so pilot in a wind of great gustiness, that that gustiness be reduced as much as possible and that the energy thus liberated is used to do the work necessary for flight. This still seems quite simple. The ideal of pilotage is to so manoeuvre that there will be as nearly as possible a constant wind speed behind the machine.

The difficulties of the actual piloting are due to the fact

that one does not know beforehand the structure of the wind, the form, periodicity and duration of the gusts. The most desirable type of gust is that which has a long period of increasing speed followed by one of constant maximum speed, a further period of decreasing speed and a final period of constant minimum. It is necessary that the difference between maximum and minimum speed be as great as possible.

When one has such a wind available piloting a soaring machine is not too difficult. During the first period (increasing wind) one will fly head to wind, and should steadily gain height during this manoeuvre. At the second period of maximum and constant wind one must turn at right-angles to the wind. Generally it will be impossible to avoid some loss of height in this period. At the beginning of the third period the machine must be turned tail to wind. As the wind is now diminishing in velocity from behind the machine, the speed of the machine through the air is effectively increasing, and it is again possible to gain height. During the fourth period of constant minimum wind one must again turn at right-angles to the wind.

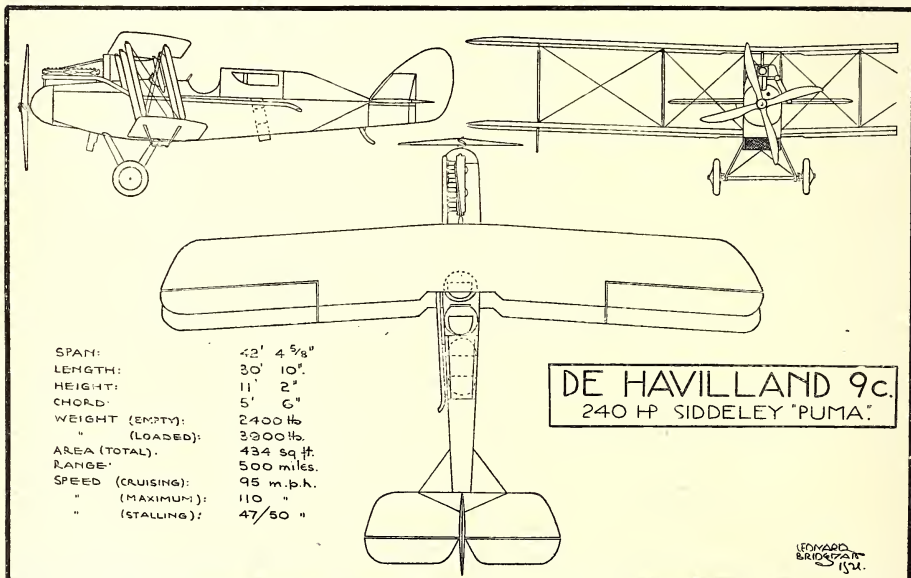
By flying in this manner one diminishes the differences of wind speed and utilises the energy of the gusts. This is the essence of piloting a soaring machine.

Therefore it is necessary to know the structure of the wind, to recognise in advance the nature of the gusts, in fact to see the gusts before they reach one, and the best preparation for such piloting is the study of the structure of the wind and of gusts.

To succeed in gaining energy from the wind in this manner it is necessary that the machine used should possess very perfect controllability, both as to elevators and to rudders. The use of wings of variable incidence has been found to give more excellent results as regards gaining energy in this manner than the usual method of using elevators.

Theory indicates the possibility of soaring in the third type of wind mentioned, that whose direction changes at different levels, but so far practice has not borne out theory, and for the moment this type of soaring is not discussed.

[The above statement, coming as it does from one in very close touch with certain of the more successful of the German soaring experts, deserves every attention from those who are interested in the subject and it is hoped that it will be possible in the near future to comment upon certain of the points raised by it.—Ed.]



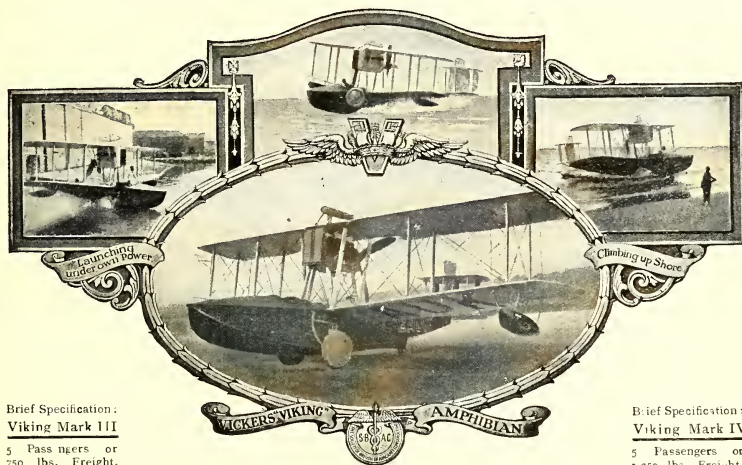
Scale Drawings of the D.H.9c, the four seater version of the D.H.9, which is doing so well in the De Havilland taxi service. This machine was described in the issue for Dec. 21st.

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SPAN : 46' 0"

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The Vickers Viking was classified **FIRST** in the following competitions at the **INTERNATIONAL SEAPLANE COMPETITIONS** at **ANTWERP, July 1920**

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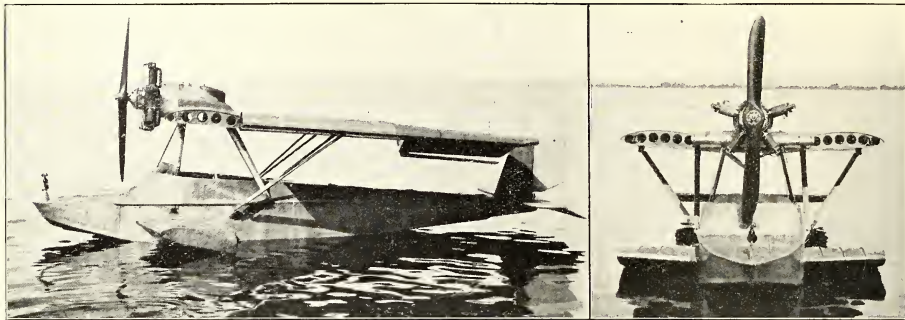
HEIGHT : 15' 1"

LENGTH : 35' 0"

The Vickers Viking was the winner of the **FIRST** prize of £10,000 for the **Amphibian Class** of Aircraft entered for the **BRITISH AIR MINISTRY COMPETITION**, September, 1920

Aviation Department,

**VICKERS HOUSE, BROADWAY, LONDON, S.W.1.**



THE DORNIER "LIBELLE."—Side and front views of the engine is a 5-cylinder 35-h.p. air-cooled radial, built by Siemens and Halske.

### MULTI-CYLINDER ENGINES.

The following letter has been received from Dr. Ing. Rumpler, at Johannisthal, dated Nov. 28th—

Sir,—In the supplement "Aeronautical Engineering to THE AEROPLANE, Vol. XXI, No. 22, of Sept. 1921, on page 258, you deal with my Doctor's thesis: "The 1,000-h.p. Rumpler Aero-Engine."

In the concluding sentence the anonymous reviewer comments on the number of cylinders—28—and the large number of parts.

In answer I would like to draw attention to the following points:—

A high-grade engine can only be obtained by the combination of the cylinders in line and radial types.

In the design in question there are seven ordinary 4-cylinder-in-line engines mounted radially about a common crankcase. This combined vertical and radial engine is fitted with an ordinary crankshaft for four cylinders. By this arrangement the number of constructional parts is kept down to a minimum.

High speed is of the maximum importance in engines. The engine of this design revolves at 2,000 r.p.m. The piston speed is only 9.33 m/sec.

The 225-h.p. Sunbeam engine, with 2,000 r.p.m. also, and a mean piston speed of 10 m/sec., has 12 cylinders; the 200-h.p. Anglo-Daimler with the same r.p.m. and a piston speed of 9.36 m/sec. has also 12 cylinders.

For a 1,000-h.p. engine under these conditions, there would be 52 to 60 cylinders. The fact the 1,000-h.p. Rumpler aero-engine has only 28 cylinders does not justify therefore the assertion that with this engine the number of parts is excessive.

(Signed)

DR. ING. RUMPLER,  
pp. DR. TRAUWEHT.

[The criticism to which Dr. Ing. Rumpler objects was in no sense intended as a condemnation of the design in question. The disadvantage of having large numbers of valves, etc., to overhaul may be overshadowed by the other advantages claimed for this type of engine. But it is apposite to remark that the 12-cylinder engines cited by Dr. Rumpler do not represent the most advanced practice either in England or in Germany.]

Both countries have produced 12-cylinder engines of 500 h.p., or for 1,000 h.p. four cylinders less than Dr. Rumpler's engine. France has a 24-cylinder 1,000-h.p. engine, and the Napier "Cub" develops over 1,000 h.p. for 18 cylinders only.—Ed.]

### A NEW PEUGEOT PRIZE.

As was announced at the time when Gabriel Poulain won the original Peugeot Prize by hopping ten metres on a winged bicycle, M. Peugeot has offered a further prize of 20,000 francs for an increased performance of the same kind.

The new prize is to be won by the first man-driven aeroplane which covers 50 metres once in each of two opposite directions over a flat surface. The use of any gas lighter than air to aid in lifting is prohibited.

The competition is open to all nationalities except Germans, Austrians, Turks, and Bulgars. Entries should be made to the Maison Peugeot, 80, Rue Danton, Levallois Perret, Seine, accompanied by an entrance fee of 10 francs.

### THE PARIS-CONSTANTINOPLE ROUTE.

The route from Paris to Constantinople, which is to be exploited in the near future by the Compagnie Franco-Rumaine, has just been covered in both directions by MM. Deulin and De Marnier, on a Lorraine engine "Spad."

The journey was begun from Le Bourget on Oct. 10th, and halts were made at Strasbourg, Prague, Budapest, Belgrade

and Bukarest. The actual flying time was 17 hours, though some weeks were actually spent en route.

The return journey occupied a further three weeks, and was completed on December 23rd in 18 hours' flying time. The distance each way is 1,770 miles.

### THE AD-ASTRA SILENCER.

On the afternoon of Dec. 13th a representative of THE AEROPLANE was given a demonstration of the Ad Astra silencer in the air. The silencer in question was the one already referred to in the issue of Dec. 7th, and was fitted to one of the De Havilland Aircraft Company's D.H.9cs (Siddeley Puma Engine).

The passenger accommodation of these machines consists of one open seat ahead of the pilot, and two seats aft of the pilot. The two latter are in one cockpit, facing one another, and the cockpit is covered by a hinged roof. The cabin so formed is open to the air, there being on each side an unglazed "window" some 6 inches deep and about 3 ft. long.

With no silencer—or with the silencer cut-out open—this cabin is little less noisy than an ordinary open cockpit, but conversation between the two occupants is possible with fair ease, as there is no direct blast of air over their heads. It is necessary to raise one's voice, and to speak very clearly. The volume of noise is very distinctly a source of discomfort.

The effect of closing the cut out, when the engine is running on full throttle, is comparable to that of throttling the engine right down. The total volume of sound is very greatly reduced; momentarily, at least, the effect is that of silence. Speech in ordinary tones is easily heard and understood, and the sense of discomfort due to noise disappears. There is actually a very considerable noise even under these conditions, but it is of a bearable type and certainly no greater than one has to endure on many railway trains.

Thus it may be said definitely that from the point of view of passenger comfort, the Ad Astra silencer is extremely satisfactory. It appears to be a fact that the silencer does not adversely influence the performance of the engine in any way, so that it may fairly be claimed that the Ad Astra Silencer is a distinct step on the road to making flying comfortable.

### COMPANY NOTICES.

#### New Company.

ATLANDWATER TRANSPORT CO. LTD.—Private company. Registered Dec. 12th. Capital £3,000 in £1 shares. To acquire the businesses of motor carriers and contractors carried on at Bishop's Stortford, (1) by H. B. Maxsted, as the "Atlandwater Transport Co."; (2) by Florence S. Culpin, as "F. S. Culpin"; and (3) by G. H. R. Chaplin, as the "Eastern Counties Transport Co.," and to carry on the business of motor haulage and cartage contractors, transporters of passengers and goods by air, land or water, freight agents, railway, shipping and general forwarding and passenger agents, etc. Permanent directors are: H. R. Maxsted (chairman), 39, South Street, Bishop's Stortford; Mrs. Florence S. Culpin, Valence, Clavering, Essex; G. H. R. Chaplin, Windhill Place, Bishop's Stortford. Qualification: £100. Secretary: Mrs. F. S. Culpin. Registered office, 39, South Street, Bishop's Stortford.

#### Mortgage.

BERMUDA AND WEST ATLANTIC AVIATION CO. LTD.—Particulars of £3,000 debentures authorised Nov. 2nd, 1921: present issue £1,300. Charged on the Company's undertaking and property, present and future, including unallotted capital.

#### Receivership.

AERO STATIONS LTD.—W. G. Oliffe, of 7, Leadenhall Street, W.C., was appointed receiver by Order of Court dated Nov. 25th, 1921, of property contained in mortgage dated Nov. 28th, 1919.



# Nature's Mixture of Petrol and Benzol

Many motorists prefer running on a mixture of petrol and benzol to using either spirit separately. "Shell" is *Nature's* mixture of petrol and benzol, perfectly combining the rapid vaporising qualities of the best petrol with the non-pinking quality of benzol. In point of fact, "Shell" Motor Spirit, **ALONE OF ALL PETROLS**, was extensively used during the war, *in precisely the same way as benzol*, for the production of those particular aromatic hydro-carbons which form the base of T.N.T. and other high explosives. It is this unique characteristic which accounts for the marked superiority of "Shell" Motor Spirit in respect of mileage, power and non-pinking.

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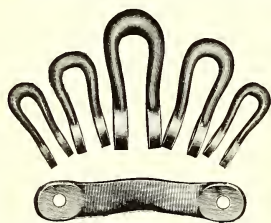
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The new types referred to are the DH.32 and the DH.34, both of which will make their first appearance on the cross-Channel air lines in the Spring of 1922. These machines will embody every improvement suggested by our exceptional experience of the design, construction and operation of commercial aircraft.

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A.G.S. 385. BALL JOINTS.  $\frac{3}{4}$  B.S.F. Material to specification No. S.1. or S.21. Socket over a length 1-4 inches; ball, diam. of spherical end, 37 inches; plug, screw thread 7/16 B.S.F.; split pin, 1/16 by  $\frac{1}{2}$  inches.—From stock

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Weldless steel tubing in carbon steels, nickel steels, and chrome nickel steels. The only suppliers and manipulators before the war, during the war, and—

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(Continued from page 4.)

the Department of Civil Aviation was persuaded to pay out subsidies without results.

On June 21st Lieut.-Col. Mervyn O'Gorman, C.B., was elected Chairman of the Royal Aeronautical Society.

On June 21st K.36, colliding with her mooring mast, suffered damage to the extent of £6,000, which amount was not available for repair.

On June 22nd Capt. Sayers published an article on his experience of travelling by airship.

On June 23rd and 24th the first trials took place of R.38 prior to handing her over to the American Air Service, when she was to become Z.R.2.

On June 22nd it was noted that the Handley Page Company had fitted a cantilever monoplane wing embodying the Handley Page slots to the fuselage of a D.H.9a, and that the machine had flown.

On June 28th the Anglo-Continental Aviation Syndicate Ltd. was registered.

During June Lieut.-Col. Barratt Lennard, then managing Handley Page Transport Ltd., appointed Ogilvie and Partners, Consulting Engineers, to run the Handley Page Transport Service. Under the able direction of Col. Bristow an immediate improvement in the service took place and shortly afterwards instead of being only allowed to carry five passengers the Handley Pages were promoted to carrying again eight passengers.

### THE SPEED RECORD.

The following letter has been received from the Commercial Director of the Nieuport-Astra Company, dated Dec. 28th:—

"Sir,—The article concerning the performance of Mr. Herbert James which appeared in *THE AEROPLANE* on Dec. 21st, 1921, page 602, contains an error which we desire to correct. The official speed record established by Sadi Lecoq on a Nieuport-Delage Avion on Sept. 26th, 1921, on the base of one kilometre covered twice in each direction (the four-run average) is 204 miles per hour and not 194 miles per hour, as your article states.

"Mr. Herbert James only having made under the same conditions 196.5 miles per hour the World's speed record is not beaten and still belongs to M. Sadi Lecoq."

[Until the record of 204 m.p.h. claimed for M. Sadi has been duly homologated by the Fédération Internationale Aéronautique at its meeting this month it is not in fact the World's Speed Record. Therefore Mr. James' speed did beat the official record as it stood when his flight was made. The official record which he beat was that made by M. Sadi at Villacoublay. The record which has not been homologated was made at Etampes just before the Deutsch Cup contest.

French reports of M. Sadi's flight at that time were far from clear and it seemed that his 204 m.p.h. was done in one single flight in one direction only, just as was Mr. James' 212 m.p.h. However, in order to put an end to any controversy it is proposed that the "Bamel" shall soon break the 204 m.p.h. record in all four flights.—C. G. J.]

### THE WORLD'S DURATION RECORD.

The following reports were received by the Exchange Telegraph Co. from the United States on Dec. 30th, 1921:—

Minneapolis, Friday.—The New York pilot Edward Stinson and his assistant Lloyd Bertaud, in an S.L.J.S. all-metal monoplane, have already broken the world non-stop record, having flown for 24 hr. 19 min. 7 sec. They are still flying.

Later.—The aeroplane has now landed, after flying, according to an unofficial timing, 26 hr. 19 min. 50 sec.

[Doubtless we shall be informed in due course why this does not beat the existing French record. Presumably the "S.L.J.S." is really a "J.L.6" (John Larsen), otherwise a Junkers, and as Germany is still excluded from the Fédération Aéronautique Internationale, it is probable that its German origin will disqualify the machine.—Ed.]

### A SUGGESTION TO THE ROYAL AERO CLUB

As soon as the "Bamel" put up its fine performance at Martlesham on Dec. 10th a storm of disbeliefs arose in France. There has always been considerable mutual doubt between the two countries as to speed timing.

The golden opportunity to fight this out once and for all would seem now to have arrived.

Let the Royal Aero Club issue a challenge to the French Aero Club for stakes of, say, £500 per side, and let the French send over their fastest machine and complete a series of side-by-side tests with the "Bamel."

It will be remembered that in pre-war days the late Mr. Gustav Hamei challenged the late M. Roland Garros to a stunting competition which the latter won.

Should the French be successful the R.A.C. might, as part of the bet, pay their expenses and *vice versa*.

A proper series of tests to eliminate flukes and bad luck could be worked out, and the challenge would be sure to draw a huge crowd if made the *pièce de résistance* at the race meeting to be held at Croydon on Easter Monday.

It was announced during the month that Sir Ross and Sir Keith Smith were making arrangements to fly round the World.

It was also made known that a 24-seater Vickers "Vimy" with Napier engines was being built.

**FOREIGN AERONAUTICS.**—On June 1st it was noted that distinct developments were taking place in Northern Europe in the direction of supplying aeroplanes to the Bolshevik Government in Russia. Several Swedes and at least one British aircraft constructor were concerned in the deal, but so far as one can discover no British machines, at any rate, have been delivered to the Bolsheviks.

On June 20th the Grand Prix of the Aero Club de France, value 100,000 francs (roughly, something less than £2,000) was won by a three-engined Farman "Goliath" piloted in turn by Messrs. Bousstrot, Gronin and d'Or. This machine covered 1,400 miles in 24 hours 8 minutes. Its actual flying time was 2½ hours.

On June 24th M. Kirch on a Nieuport raised the height record to 32,834 feet.

On June 27th a Vickers "Vimy," Rolls-Royce engines, made a trial trip on the Pekin-Tsuan air line, the distance being 180 miles out and 180 miles home. The journey was without incident. Great rejoicings and an exhibition of flying took place at Pekin to celebrate the event. No regular air service has been run since then.

One offers the suggestion to the R.A.C. for what it is worth, believing that here is a suggestion to the governing body of the sport of flying to do something to uphold the good name of British flying.—G. D.

### THE NICE AVIATION MEETING.

Is it possible that, with the advent of another year, there may be forthcoming a British sportsman who will be willing to finance and equip a little expedition consisting of one or two pilots and one or more high-speed aircraft with the necessary retinue of mechanics to go to Nice and compete with the pick of the French pilots at the forthcoming Nice Aviation Meeting? With all due respect to our French friends and rivals, one feels sure that there are many British pilots who could put up an excellent show even in the face of the formidable array of famous pilots who have promised to be present at Nice.

Surely, by now, international aviation can rank with international yacht racing, horse racing, Rugby football, athletics, etc., in so far as prestige is concerned, so that it certainly seems time that British aviation should compete on equal terms with other countries whenever the opportunity occurs. It is not sufficient merely to repeat the show put up in the 1920 Gordon Bennett race, to quote one instance, where the indomitable spirit shown by the pilots and crews of the two British entries who were practically unsupported from home was entirely overshadowed by competition not with superior machines but with superior organisation.

The organisation of the "Nice Week," which will take place some time in March, has been undertaken by M. Bernard, President of the Club des Pilotes of the Côte d'Azur, and it has the official encouragement of the Under Secretary of State for Aeronautics.

Among some of the spectacles so far arranged are the complete re-construction of an aerial battle, with balloons burning, etc., an attack on an airship, inter-squadron fighting, the attack on, and destruction of a ship by torpedoes, and exhibition flying, passenger carrying, etc. During the meeting much "efficiency" will take place and lectures will be given by Lieut. Ferrarin on his Paris-Tokio flight, MM. Fonck, Flandin, etc.

Such well-known names as Sadi-Lecoq, Bernard, Bousstrot, Fonck, Nungesser, Madon, Colonel Piccio, Lieut. Ferrarin, Fronval, Chevallier of "chute de côté" fame, René Simon, known in the early days as "le fool flyer," will appear on the programme.

It is to be hoped that the final list will contain at least one British name, if only in order to inspire everyone to do his best, energised by that wonderful stimulant international rivalry.

### TO SCIENTIFIC READERS.

It has already been noted in *THE AEROPLANE* that M. G. Roche d'Estrez, the energetic Editor of *L'Air*, has now taken over the publication of *La Technique Aéronautique*, which is a journal appealing particularly to scientists and trained engineers concerned with aviation.

Arrangement have been made by which a limited number of copies of *La Technique Aéronautique* will be sent immediately on publication to publishers of *THE AEROPLANE*, where copies may be obtained price 1s. 6d. post free from *THE AEROPLANE* Publishing Office, 14, Bream's Buildings, E.C.4.

*L'Air* and *La Technique Aéronautique* may be had together for 2s. post free.



## R.A.F. INTELLIGENCE.

## R.A.F. Appointments.

S/Ldr. R. B. Ward, A.F.C., from No. 29 Gr. H. (C.A.), to School of Naval Co-operation and Aerial Navigation (C.A.). 30/1.  
S/Ldr. G. J. Watney, O.B.E., from Egyptian Gr. H.Q. (M.E.A.) to R.A.F. Depot (I.A.) 7/11.  
S/Ldr. J. C. Guinness, D.F.C., from No. 3 F.T.S. (I.A.) to School of Naval Co-operation and Aerial Navigation (C.A.). 30/1.  
F/Lt. T. O. Studd, D.F.C., from School of Army Co-operation (I.A.) to School of Naval Co-operation and Aerial Navigation (C.A.). 30/1.  
F/Lt. G. H. Hooper, M.C., D.F.C., from No. 207 Sqdn. (I.A.) to School of Naval Co-operation and Aerial Navigation (C.A.). 30/1.  
F/Lt. V. R. Scriven, A.F.C., from H.M.S. *Pegasus* (Mediterranean Group) to No. 207 Sqdn. (I.A.). 1/12.  
F/Lt. G. W. Biles, D.F.C., from C.F.S. (I.A.) to School of Naval Co-operation and Aerial Navigation (C.A.). 30/1.

## New Year's Awards and Promotions.

AIR MINISTRY, Jan. 2nd.

The King has been pleased to approve of the following awards to officers of the Royal Air Force:—

SECOND BAR TO THE AIR FORCE CROSS.—Squadron Leader William Ronald Read, M.C., D.F.C., A.F.C. (Capt. Dragon Guards).

BAR TO THE AIR FORCE CROSS.—Squadron Leader Roderic Maxwell Hill, M.C., A.F.C.

THE AIR FORCE CROSS.—Flight Lieut. Augustus Henry Orlebar, Flight Lieut. David Arthur Stewart, M.C., D.F.C., Flying Officer Sidney Norman Webster.

## PROMOTIONS.

The following officers are promoted to the ranks stated, with effect from Jan. 1st:—

## GENERAL LIST.

AIR COMMODORE TO BE AIR VICE-MARSHAL.—Philip Woodcott Game, C.B., D.S.O.

GROUP CAPTAINS TO BE AIR COMMODORES.—Hugh Caswell Tremehere Dowding, C.M.G., Bertie Clephane Hawley Drew, C.M.G., C.B.E., Charles Rumney Sanison, C.M.G., D.S.O., A.F.C., Robert Hamilton Clark Hall, C.M.G., D.S.O.

WING COMMANDERS TO BE GROUP CAPTAINS.—Alfred Drummond Warrington-Morris, C.M.G., O.B.E., Norman Duckworth Kerr MacEwen, C.M.G., D.S.O., Hon. John David Boyle, C.B.E., D.S.O., Edward Featherstone Briggs, D.S.O., O.B.E., Peregrine Forbes Morant Fellowes, D.S.O.

SQUADRON LEADERS TO BE WING COMMANDERS.—Dermott Lang Allen A.F.C., Charles Humphrey Kingsman Edmonds, D.S.O., O.B.E., Richard Edmund Charles Peirse, D.S.O., A.F.C., Reynell Henry Verney, O.B.E., Thomas O'Brien Hubbard, M.C., A.F.C., Lawrence Arthur Pettinson, D.S.O., M.C., D.F.C., Hazelton Robert Nicholl, O.B.E., Arthur Thomas Whitlock, Robert John Ferguson, Barton, O.B.E., William Lawrie Welsh, D.S.C., A.F.C., Hugh Lambert Reilly, D.S.O.

FLIGHT LIEUTENANTS TO BE SQUADRON LEADERS.—William Bowen Hargrave, O.B.E., Hugh Vernon Champion de Crespigny, M.C., D.F.C., Ivor Thomas Lloyd, Eric John Hodsoll, Raymond Cullishaw D.S.O., O.B.E., D.S.C., D.F.C., Cyril Gordon Burge, O.B.E., Francis William Lerwill, O.B.E., Charles Henry Elliott-Smith, A.F.C., Charles Oscar Frithiof Modin, D.S.C., Sir Christopher Joseph Quentin Brand, K.B.E., D.S.O., M.C., D.F.C.

FLYING OFFICERS TO BE FLIGHT LIEUTENANTS.—Herbert Martin Massey, M.C., Geoffrey Arthur Henzell Pidcock, Cecil Alfred Stevens, M.C., Walter Travis Swire Williams, D.S.C., Samuel Marcus Kinkead, D.S.O., D.S.C., D.F.C., Seymour Stewart Benson, A.F.C., Edward Derek Davis, Peter Cundle Wood, Robert Allingham George, M.C., Frederick McBean Fall, Allen Robert Churchman, D.F.C., Bernard McEntegart, Peter Warburton, M.B.E., Frank Gerald Craven Wear, M.C., William Edmund Somervell, Alfred Conrad Collier, Kenneth Buchanan Lloyd, A.F.C., George Thomas Richardson, Marjorie Henry Butler, D.F.C., William Geoffrey Eggitt, M.C., Eric John Webster, D.F.C., Herbert Edwin Tansy, M.C., Ian Cullen, A.F.C., George Cecil Gardner, D.F.C., Arthur Vincent Howard Gompertz, Marjorie Moore, Arthur Francis Quinlan, Percy John Barnett, M.C., Sydney Edward Toomer, D.F.C., Leslie Norman Hollinghurst, D.F.C., Clement Flegg Horsley, M.C., Charles Basil Slater Spackman, D.F.C., Ernest Lionel Ardley, Richard Michael Trevelthan, M.C., Neville Byron Ward, Edward Reginald Openshaw, Reginald Thomas Brooke Houghton, A.F.C., Ralph Myddleton Bankes-Jones, James John Williamson, A.F.C., Owen Washington de Putron, Robert Hugh Hammer, M.C., Victor Hubert Tait, James Matthews McEntegart, Robert William Edwards, James Alexander Gordon Haslam, M.C., D.F.C., Kenneth Lloyd Harris, Albert Grounds Peace, A.F.C., William Conway Day, M.C.

## STORES LIST.

SQUADRON LEADER TO BE WING COMMANDER.—Walter John Dakins Pryce, O.B.E., D.C.M.

FLIGHT LIEUTENANTS TO BE SQUADRON LEADERS.—William Boston Cushion, Eric Rivers-Smith, M.B.E., James Ambrose Stone, William Henry George Maton, M.B.E.

FLYING OFFICERS TO BE FLIGHT LIEUTENANTS.—Arthur Ben-

jamin Wiggan, William Arthur Kingston, Ernest William Crosbie, Frederick Thomas McElwale, Arthur Myrtle Saywood, Harry Leonard Woolveridge, Arthur Elias Sutton-Jones, Patrick John Murphy, John Henry Dale, Edward Ernest Porter, M.B.E., D.C.M., Edwin Harold Eldridge, Marjorie Jewson James, M.B.E., Reginald Harry Smyth, M.C., Alfred Horace Comfort, Henry Sewell Alger, Leonard Arthur Laverder, Richard Adams, Lamont Smith, Charlie Young Mitchell, John Augustus Plunkett.

## MEDICAL SERVICE.

SQUADRON LEADER TO BE WING COMMANDER.—Henry Wakeham Scott, M.B., B.A.

FLIGHT LIEUTENANTS TO BE SQUADRON LEADERS.—Robert Ernest Bell, M.B., Gerald Struan Marshall, O.B.E., Eric William Craig, M.C., M.B., Robert Andrew George Elliott, M.B., B.A.

FLIGHT LIEUTENANT TO BE HONORARY SQUADRON LEADER.—William Rous Kemp, B.A.

## The R.A.F. Club.

Hitherto one has refrained from touching in this paper the affairs of the Royal Air Force Club though on many occasions one has been asked to do so. One has regarded the Club as a purely private affair of the officers past and present of the R.A.F. and therefore not a subject for public notice. Now, however, the position has been altered by the Committee of the Club itself which last week invited a number of newspaper people to a private view of the Club's new premises and to a free lunch afterwards. Personally one refused the well-meant invitation, primarily because one considered that the Committee was ill-advised in asking the Press inside the Club and secondly because to have accepted the hospitality of the Club (as distinct from the hospitality of an individual member) would have made criticism impossible.

If the Club had been a commercial speculation, like any ordinary proprietary club, and wished to acquire members one could have understood and have commended this Press view and the many paragraphs which appeared in consequence in the newspapers of Jan. 1st and 2nd. As propaganda for a new Lyons Corner House or even a new great hotel the operation would have been quite good business. But in connection with a purely Service club for officers and gentlemen one can only regard the proceedings as undignified.

It is said that Lord Cowdray has spent £370,000 on the R.A.F. Club in its past and present premises. His generosity is to be admired. His judgment is to be deplored, for he could have done so much more for aviation and for the R.A.F. by a more judicious expenditure of this vast wealth.

The effect of this Press propaganda (for it can be nothing else) on the Senior Services can only be entirely regrettable. Everything should be done to drive into the Navy and Army the fact that the R.A.F. is their equal in every way, especially in dignity and in good form. But can one imagine the Rag or the Senior or the In-and-Out organising a Press view with paragraphs to follow? The best people in the R.A.F. can but regard this affair as a regrettable incident the memory of which can only be eliminated by time.

However, now that the R.A.F. Club has chosen to make itself public property one's conscience is left free to discuss its affairs whenever it may seem well to do so in the interests of those who are qualified for membership of what promises to be at any rate one of the most pleasant of London's co-operative palaces.—C. G. G.

## The Troubles in Egypt.

The following paragraph appears in a warning issued by the Authorities to the General Public in the Suez area:

"If aeroplanes perceive an assembly they will drop smoke bombs; if the assembly does not disperse they will drop shells and open fire with their machine-guns."

## R.A.F. SPORTS AND PASTIMES.

## Sports Board January Fixtures.

Jan. 7th.—Rugby.—R.A.F. v. Northampton, at Northampton.  
Jan. 11th.—Rugby.—R.A.F. v. Guy's Hospital, at Honor Oak.  
Fencing.—R.A.F. v. Bertrand's Academy, Hanover Square, W.1.  
Jan. 19th.—Rugby.—R.A.F. v. Blackheath, at Blackheath.  
Jan. 21st. to 28th.—Association.—R.A.F. Memorial Fund Football Week.  
Jan. 28th.—Rugby.—R.A.F. v. Llanelli, at Llanelli.

## The R.A.F. Rugby Team

The R.A.F. v. Leicester.—The R.A.F. played their first match this season against Leicester at Leicester on Dec. 24th. The teams were evenly matched, Leicester winning by a penalty goal and a try (6 points) to a placed goal. In the first half in spite of repeated attacks the R.A.F. failed to score, Leicester putting up a brilliant defence.

In the second half a powerful rush by the R.A.F. forwards led to a try by F/Lt. Bryson, S/Ldr. Hicks converting.

The R.A.F. team was as follows:—F/O. H. R. Storrs; Cdt. Forster, F/O. C. B. Riddle, F/Lt. O. C. Bryson, F/O. W. Jones; F/O. J. K. Smith, F/Lt. J. C. Russell; F/Lt. W. W. Wakefield, F/Lt. R. H. C. Usher, F/Lt. S. P. Simpson, S/Ldr. W. C. Hicks, Sjt. Smith, F/O. J. C. L. Drabble, F/O. T. L. Lowe, and F/Lt. E. F. Turner.

The R.A.F. v. The Harlequins.—Playing at Queen's Club on Dec. 26th the R.A.F. beat the Harlequins by 3 goals (15 points) to nil. The first try was scored just before half time by Cadet Forster from a clever piece of passing on the left. S/Ldr. Hicks converted.

Ten minutes after half time F/Lt. Wakefield got the ball from the line out and burst through, scoring between the posts, Hicks again converting. From a short cut through by F/O. J. I. T. Jones, Wakefield accepted a pass and went clean through for a try, Hicks converting once more.

The R.A.F. played a vigorous game with hard tackling and spoiling, using their feet to effect in the open. The team was as follows:—Cdt. Coventry, full back; F/O. H. H. Storrs, F/O. W. Jones, F/Lt. O. C. Bryson, Cdt. Forster, three-quarter backs; F/O. J. I. T. Jones and F/Lt. J. C. Russell, half-backs; F/Lt. W. W. Wakefield, (captain), F/O. T. L. Lowe, S/Ldr. W. C. Hicks, Sjt. Smith, F/Lt. R. H. C. Usher, F/Lt. S. P. Simpson, F/O. J. E. L. Drabble, and F/Lt. E. F. Turner, forwards.

### Biggin Hill.

BOXING.—On Dec. 13th, a boxing tournament was held at Biggin Hill, the programme being arranged jointly by the Editor of the *News of the World*, Sjt. Caunter of the Bromley Police, and F/O. Adkins of the Instrument Design Establishment, R.A.F.

There was plenty of variety in the programme, which included an exhibition by the one and only Jimmy Driscoll and Bowker, both too well known to need any further introduction. Later in the evening Bowker and Wally Pickard put up as funny a boxing show as one could hope to see, Pickard being a specialist in acrobatic boxing as well as a most amusing person "off duty." The police provided some very fine fights, P.Cs. Harvey and Beal in particular both knocking their opponents out in promising style.

The chief fight of the evening was between L/AC. Crisp Kenley and AC. Wells of I.D.E. After six hard-fought rounds the judges disagreed and the referee gave a draw. AC. Prescott lost very graciously to a cooler and better man, AC. McKenzie, in three rounds.

The Editor of the *News of the World* presented very suitable prizes and the cheers given for him showed that all present greatly appreciated his efforts.

F/O. Adkins and his staff are to be congratulated on the excellent organisation of the evening's entertainment.

### NEW YEAR'S HONOURS.

The following names of officers and gentlemen concerned with aviation appear in the list of New Year's Honours.

#### ORDER OF THE BATH.

The King has been pleased to give orders for the following promotions in and appointments to the Order of the Bath:—

THE AIR FORCE.—K.C.B. (Military Divn.)—Fell, Group Capt (acting Air Commodore) Matthew Henry Gregson, C.B., C.M.G., R.A.F. Med. Serv.

C.B. (Military Divn.)—Borton, Group Captain Amyas Eden, C.M.G., D.S.O., A.F.C., R.A.F.

C.B. (Civil Divn.)—Smith, William Sydney, Esq., O.B.E., Supt. of the Royal Aircraft Establishment, S. Farnborough.

#### THE ORDER OF THE BRITISH EMPIRE.

To be Knight Commander (K.B.E.).—Letts, William Malesbury, Esq., C.B.E. For public services. (Sir W. M. Letts is the moving spirit of Crossley Motors Ltd., which firm holds a controlling interest in A. V. Roe & Co., Ltd., and has done much for the R.F.C. and R.A.F. by supplying reliable transport vehicles.)

### THE ROYAL AERO CLUB.

The following were appointed to represent the Club at the Air Conference to be held in London in February:—Brig.-Gen. Sir Capel Holden, K.C.B., F.R.S., Lieut.-Col. J. T. C. Moore-Brabazon, M.C., M.P., Lieut.-Col. F. K. McIlvan, Mr. T. O. M. Sopwith, and H. E. Perrin. Lieut. Col. Mervyn O'Connor, C.B., was appointed to represent the Club at the meeting of the Committee of the Federation Aéronautique Internationale to be held in Paris on Jan. 9th, 1922.

The following British Record was passed.—Class "C" No. 48.—*Greatest Speed* over a straight-line course of one kilometre:—"Mars I," Gloucestershire Aircraft Co. Ltd, Cheltenham; 450-h.p. Napier "Lion"; Pilot, J. H. James; at Martinstash Heath, Dec. 14th, 1921 (being the mean speed of four runs in accordance with the regulations of the Federation Aéronautique Internationale), 316.5 kilometres per hour (196.6 miles per hour).

The acceptance by Wing-Commander W. D. Beatty of his appointment as Member of the Committee was reported.

The following Aviators' Certificates were granted:—7928 Stanley Baker (March 31st, 1917); 7919 George Beacall Powell (Dec. 8th, 1921). [Better late than never.—Ed.]

### PERSONAL NOTICES.

DEATH.  
WOOD.—On Dec. 10th, at Elm House, Ipswich, of illness contracted in Egypt, Leslie Gronow Wood, Flying Officer, R.A.F. ("Splinter"), second son of Dr. and Mrs. A. T. Wood.

ENGAGEMENT.  
FAIRBAIRN—RIDLEY.—The engagement is announced between Maj. C. Osborne Fairbairn, A.F.C., late 3rd Royal North Lancashire Regt. and R.A.F., eldest son of Mr. Charles Fairbairn, of Woolcomatona, Victoria, and of the late Mrs. Charles Fairbairn, and Irene Florence, elder daughter of Mr. and Mrs. E. L. Ridley, of Sutton, Surrey.

MARRIAGES.  
BURKETT—TRACY.—On Dec. 6th, at Littleham Church, Exmouth, by the Rev. A. L. Manby, Vicar of Stratford, Yorks, G. T. W. Burkett, M.C. (formerly Australian Artillery and Lieut. R.A.F.), only son of Mr. G. Burkett and Mrs. Burkett, of Melbourne, Australia, to Adelaide Henrietta, elder daughter of the Rev. F. W. Tracy and Mrs. Tracey, of 14, Morton Crescent, Exmouth. (Australian papers, please copy.)

DE HAVILLAND—SWABY.—On Dec. 9th, at the Embassy Chapel, Madrid, by the Rev. F. Symes-Thompson, Chaplain to the British Embassy, Major Howard de Havilland, D.S.O., M.C., third son of the late Rev. C. M. de Havilland, rector of Crux Easton, to Mary Proctor Swaby, only child of Mrs. J. de Solia, of Madrid, and the late Dr. William Frey Swaby.

BIRTHS.  
HEGARTY.—Dec. 29th, at Lampeter, Woking, to H. G. Hegarty, M.C., late R.F.C., and Lena (nee Homersham)—a son.

ROGERS.—To Maggie, the wife of Walter Rogers, late Serjt. R.A.F., a daughter (Joyce Constance), at 1, Bonnington Square, Vauxhall, on Dec. 1st.

[Mr. Rogers is the well-known pilot of Handley Page Transport, and he assures one that Joyce Constance is very controllable.]

### HONOUR WHERE DUE.

Apocryph of the favourable comment which has been evoked concerning the new Gas Starter for aero engines which the Bristol Aeroplane Co. Ltd. have produced, the firm desires to draw attention to the considerable amount of experimental work which had previously been carried out by the Royal Aircraft Establishment on gas starters. This work at the R.A.E. was in the hands of the late Major Norman, the well-known authority on air-cooling, and a debt is due to his memory for the measure of development which was reached.

The R.A.E. was certainly responsible for the first idea of the power gas starter and for its early development, but the apparatus which the Bristol Aeroplane Co. Ltd. have produced is the result of further close study of the requirements which starters have to fulfil, and they have been able to place on the market a very compact light-weight starting engine to meet a need which has long been felt by the aircraft constructor. This is only another example of the valuable research work which the R.A.E. is continually carrying on, and such work is undoubtedly of immense service to the development of British aeronautical equipment.

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# COMMERCIAL AERONAUTICS

## AND CIVIL AERIAL TRANSPORT.



THE UNITED KINGDOM OF GREAT BRITAIN AND IRELAND.

### CONTINENTAL ARRIVALS AND DEPARTURES.

[The following table of arrivals at and departures from the British Air Ports is compiled on the following system:—First comes the initials of the Air Line; next the type of machine; next the international number of the machine; next the ports of departure and destination; next the times of departure and arrival; next the cargo, whether goods (G) and/or mails (M); next the number of passengers; and finally the service of the pilot and number of mechanics, if any.]

ABBREVIATIONS:—A.D.—Aircraft Disposal Co. B.A.—Berkshire Aviation Co. B.C.—Bristol Aeroplane Co. B.M.—Brompton Motor Co. C.A.—Department of Civil Aviation. D.H.—De Havilland Aircraft Co. G.E.—Compagnie des Grands Express Aériens. H.P.—Handley Page Transport Ltd. I.L.—Institute Air Line. K.L.—Koninklijke Luchtvaart Maatschappij. L.A.—Leatherhead Aviation Services. M.A.—Messageries Aériennes. M.W.—Marconi Wireless Telegraph Co. Ltd. P.O.—Privately owned. P.L.—Pettus Ltd. S.F.—Surrey Flying Services. S.X.—Syndicat National pour l'Etude des Transports Aériens (S.N.E.T.A.).

### The London Terminal Aerodrome, Croydon. (Telephone: Croydon 2720.)

#### DECEMBER 19th:

I.L., DH8, G-EAWO, London-Paris, 12.10-17, G.M., 3, Holmes & I. A.D., DH8, G-EAZO, London-Brussels, 12.22-15.15, Nil, Nil, Muir. A.D., DH8, G-EAZM, London-Brussels, 12.25-15.16, Nil, Nil, Porty. H.P., G-EATH, Paris-London, 11.09-14.49, G., Nil, McIntosh & I. G.E., Goliath, F-ADDT, Paris-London, 11.37-16.48, G., 1, Favreau & I. I.L., DH8, G-EAWW, Paris-London, 12.00-15.08, G., 4, Courtney & I. M.A., Breguet, F-ADAU, Paris-London, 12.55-16.01, G.M., Nil, Range. I.L., Vimy, G-EASI, Paris-London, 12.05/18th-10.00/20th, Nil, Nil, Robins & I.

#### DECEMBER 20th:

G.E., Goliath, F-ADDT, London-Paris, 11.39-13.49, G., Nil, Favreau & I. M.A., Breguet, F-ADAU, London-Paris, 12.15-14.45, G., Nil, Range. H.P., HP, G-EAWH, London-Paris, 12.54-14.52, G.M., 2, Olley. I.L., Vimy, G-EASI, London-Paris, 13.00-15.38, G.M., 5, Courtney & I. A.D., DH8, G-EBAZ, London-Brussels, 13.34-14.57, Nil, Nil, Muir. A.D., DH8, G-EAZZ, London-Brussels, 14.00-15.25, Nil, Nil, Shaw. G.E., Goliath, F-HMFU, Paris-London, 11.55-16.08, G., 5, Chalmers & I.

#### DECEMBER 21st:

H.P., HP, G-EATH, London-Paris, 12.07-15.05, G., 6, Wilcockson & I. I.L., DH8, G-EAWW, London-Paris, 12.20-15.00, G.M., 5, Robins & I. G.E., Goliath, F-HMFU, London-Paris, 12.45-17, G., 4, Chalmers & I. A.D., DH8, G-EAZZ, London-Brussels, 13.25-15.39, Nil, Nil, Muir. H.P., DH8, G-EAWH, Paris-London, 11.59-16.00, Nil, 2, Olley. I.L., Vimy, G-EASI, Paris-London, 12.00-15.38, G., 5, Courtney & I. I.L., DH8, G-EAWW, Paris-London, 12.00-15.13, G., Nil, Holmes & I. M.A., Spad, F-ACMI, Paris-London, 12.47-15.58, G.M., Nil, Paillet. M.A., Spad, F-ACMI, Paris-London, 13.45-16.20, G., Nil, Robyn & I.

#### DECEMBER 22nd:

I.L., DH8, G-EAWO, London-Paris, 12.15-16.00, G.M., 5, Holmes & I. H.P., HP, G-EATH, London-Paris, 12.17-15.18, G., 6, McIntosh & I. H.P., DH8, G-EAWH, London-Paris, 12.50-15.39, Nil, 2, Olley. M.A., Spad, F-ACMG, London-Paris, 12.50-13.35/23rd, Nil, Nil, Robyn. M.A., Spad, F-ACMG, London-Paris, 12.50-16.5, G., Nil, Paillet. H.P., HP, G-EATH, Paris-London, 11.02-14.03, G., 3, Courtney & I. I.L., DH8, G-EAWW, Paris-London, 12.25-14.52, G., 2, Robins. M.A., Spad, F-ACMF, Paris-London, 12.50-10.38/23rd, G.M., 2, Portal.

#### DECEMBER 26th:

I.L., DH8, G-EAWO, London-Paris, 12.11-14.55, G., 1, Courtney & I. I.L., DH8, G-EAWW, Paris-London, 12.35-14.54, G., Nil, Holmes & I. H.P., HP, G-EATH, Paris-London, 12.55-15.35, Nil, Nil, McIntosh & I.

#### DECEMBER 27th:

D.H., DH8, G-EAYT, London-Barcelona, 10.35-17, Nil, Nil, Cobham. G.E., Goliath, F-GEAO, London-Paris, 12.02-14.15, Nil, 1, Chalmers & I. H.P., HP, G-EATH, London-Paris, 12.05-14.46, Nil, 2, Olley & I. I.L., Vimy, G-EASI, London-Paris, 12.10-14.48, Nil, 2, Robins & I. M.A., Spad, F-ACMI, London-Paris, 12.24-14.42, Nil, Nil, Delage. I.L., Vimy, G-EAWO, Paris-London, 12.35-15.39, G., 3, Courtney & I. G.E., Goliath, F-ADDT, Paris-London, 12.35-14.25, Nil, 2, Gastoux & I. M.A., Spad, F-ACMI, Paris-London, 13.04-16.31, G.M., Nil, Range.

#### DECEMBER 28th:

NIL.

#### DECEMBER 29th:

G.E., Goliath, F-ADDT, London-Paris, 11.20-13.30, G., 2, Gastoux & I. H.P., HP, G-EATH, London-Paris, 12.00-14.49, G., 5, Wilcockson & I. I.L., DH8, G-EAWW, Paris-London, 12.15-14.20, G.M., 3, Holmes & I. M.A., Breguet, F-ADDM, London-Paris, 12.30-14.48, G., Nil, Perignon. M.A., Spad, F-ACMI, London-Paris, 12.31-14.50, G., Nil, Range. A.D., Bristol, G-EBAK, London-Paris, 12.35-14.25, Nil, Nil, Ortweiler. A.D., Bristol, G-EBAK, London-Brussels, 14.47-16.21, Nil, Nil, Muir. H.P., HP, G-EATH, Paris-London, 11.04-15.15, G., 2, Olley & I. G.E., Goliath, F-GEAI, Paris-London, 11.55-16.00, G., 2, Mire & I. I.L., Vimy, G-EASI, Paris-London, 12.07-15.36, G., 2, Robins & I. M.A., Spad, F-ADAF, Paris-London, 12.55-16.32, G.M., Nil, Le Sec.

#### DECEMBER 23rd:

M.A., Spad, F-ACMF, London-Paris, 12.20-14.42, G., Nil, Portal. H.P., HP, G-EATH, London-Paris, 12.14-14.50, G., 3, Rogers. I.L., Vimy, G-EASI, London-Paris, 12.18-15.15, G.M., 6, Robins & I. D.H., DH8, G-EAYU, Paris-London, 10.55-16.46, G., Nil, Cobham. H.P., DH8, G-EAWH, Paris-London, 11.05-15.50, G., 2, Olley. G.E., Goliath, F-GEAI, Paris-London, 12.10-15.31, G., 7, Mire & I. I.L., DH8, G-EAWO, Paris-London, 12.15-15.25, G., 5, Holmes & I.

#### DECEMBER 24th:

G.E., Goliath, F-GEAI, London-Paris, 11.55-14.03, G., 8, Mire & I. H.P., HP, G-EATH, London-Paris, 12.14-14.40, G.M., 6, McIntosh & I. I.L., DH8, G-EAWW, London-Paris, 12.23-14.25, G.M., 5, Holmes & I. M.A., Spad, F-ADAF, London-Paris, 12.30-14.40, G., Nil, Donelin. M.A., Spad, F-ADAF, Paris-London, 13.00/23rd-11.56, G., Nil, Donelin. H.P., HP, G-EATH, Paris-London, 11.12-15.01, G., 1, Rogers & I. I.L., Vimy, G-EASI, Paris-London, 11.53-15.54, G., Nil, Robins & I. G.E., Goliath, F-GEAO, Paris-London, 11.55-15.15, G., 2, Chalmers & I. M.A., Spad, F-ACMI, Paris-London, 11.40-14.40/26th, G., Nil, Delage. M.A., Breguet, F-ADDM, Paris-London, 09.35-13.47, Nil, 1, Perignon.

#### DECEMBER 25th:

NIL.

### Inland Flying at Croydon.

Dec. 10th and 20th.—Nil.  
Dec. 21st.—H.P., HP Bristol (McIntosh & I.) I.L., DH8 test, (Bernard)  
Dec. 22nd and 23rd.—Nil.  
Dec. 24th.—D.H., HP from Stag Lane (Cobham).

### Cross-Channel Statistics.

Week ending December 25th:—  
Machines, 49; Passengers, 108; Crews, 75; Total Personnel 181  
Corresponding week last year:—  
Machines, 19; Passengers, 0; Crews, 18; Total Personnel, 27

#### DECEMBER 30th:

H.P., HP, G-EATH, Paris-London, 11.20-15.55, Nil, Nil, McIntosh & I.

#### DECEMBER 31st:

H.P., HP, G-EATH, London-Paris, 12.05-14.20, G.M., 4, Rogers & I. I.L., DH8, G-EAWO, London-Paris, 12.07-14.07, G.M., Nil, Robins & I. M.A., Spad, F-ADAF, London-Paris, 12.08-14.16, G., Nil, Le Sec. I.L., DH8, G-EAWW, Paris-London, 12.05-14.45/1st, G., 7, Holmes & I. M.A., Breguet, F-ADAF, Paris-London, 13.15-14.40/1st, M.G., Nil, Robyn.

#### JANUARY 1st, 1922:

I.L., Vimy, G-EASI, London-Paris, 12.12-14.55, G., 1, Courtney & I. I.L., DH8, G-EAWO, Paris-London, 12.00-14.13, G., 3, Robins & I.

### Inland Flying at Croydon.

Dec. 26th.—S.F., Avro joy-rides (Muir).  
Dec. 27th.—S.F., Avro joy-rides (Muir).  
Dec. 28th.—Nil.  
Dec. 29th.—H.P., W8 from Cricklewood (Rogers & I.).  
Dec. 30th.—Nil.  
Dec. 31st.—H.P., W8, joy-rides (Rogers & I.); I.L., Vimy, joy-rides (Bernard & I.).  
Jan. 1st.—Nil.

### Cross-Channel Statistics.

Week ending January 1st:—  
Machines, 39; Passengers, 49; Crews, 48; Total Personnel, 97  
Corresponding week last year:—  
Machines, 8; Passengers, 10; Crews, 10; Total Personnel, 20

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LONDON TERMINAL AERODROME, CROYDON.

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## The London Terminal Aerodrome.

### THE INSTONE AIR LINE.

The chief excitement of the Christmas period was the donning of the new uniforms by the pilots and staff. Except for the fact that the commissionaire seems to look the most senior, by virtue of his blue patches on collar and cuffs making him look like a G.S.O.I., and one other resembling a midshipman, the idea is not at all bad and will improve with time and usage, especially if future uniforms improve in cut and fit.

One would suggest that there should be "wings" for pilots and certainly a single wing for mechanics who fly. This latter especially would make for keenness as it will be remembered how much in the old R.F.C. days the observer's wing was coveted.

A photograph of Messrs. Barnard and Game in uniform appeared in the *Daily Mail* under the heading of "Spick and Span." It is thought at the aerodrome that the *Mail* is about to begin the "Adventures of Spick and Span" to rival those of "Matt and Jeff" and "Pip, Squeak, and Wilfred."

The Instone Air Line next year in addition to the Vimy and the three D.H.18s will most likely use two D.H.32s and some of a new 8-seater Vickers with a 360-h.p. "Eagle" Rolls-Royce. Also they will use when ready the twin-Napier Vickers to which reference has already been made.

Messrs. Holmes, Robins and Courtney have been on the Service this week and Mr. Barnard has been flying the "Vimy" and the D.H.18s, his arm being practically all right again.

### HANDLEY PAGE TRANSPORT.

The outstanding event of the over-eating season was a magnificent flight on Friday by Mr. MacIntosh, who with Mr. P. Reid as his mechanic brought an O/400 from Paris to London against the gale, taking four hours and thirty-five minutes for the trip.

Mr. MacIntosh, and Mr. Wilcockson on another O/400, both left Le Bourget at 11.20, on being assured by the French Meteorological people that the wind on the route nowhere exceeded 15 m.p.h. When near Berck one of Mr. Wilcockson's engines suffered from overheating (not to be confused with over-eating) and so he landed to rectify matters. Mr. MacIntosh then decided to land alongside to render assistance. When he was within a few feet of the ground he saw the other machine blown right over onto one wing-tip and then onto the other and smashed, so he opened up both engines full and went up again like a lift.

He carried straight on and at about 15.40 hours he was sighting at Croydon. He had a very rough time landing owing to the gusts and all available hands had to hold the machine down as the wind speed was about equal to the flying speed of the O/400.

Mr. MacIntosh told one that Mr. Reid was of very great assistance to him on the flight and without his help he would not have got through. Flying the O/400 in such weather is more than a one man job.

Mr. Rogers brought the W.8 over from Cricklewood on Thursday and on Saturday he was taking up members of a Japanese Commission in lots for joyrides. The climb of the machine was really remarkable.

On Boxing Day the gentleman who manages the free publicity department of Handley Page Transport Ltd. once more asserted himself in his own inimitable way. As the line have not for many months indulged in the "heart interest" type of publicity one had hoped that the peculiar official had mended his ways.

The hope was ill-founded as the papers have all had silly sensational paragraphs containing vulgar and sordid details as to how the passengers carried by a Handley Page were able to gorge themselves on roast turkey and plum pudding "haring horrid high across the heavens hogging homeward" or words to that effect.

If only the said official would spend his superfluous energy in trying to institute the regular service of lunch daily on the trip instead of making a stunt of it he would earn the thanks of all who travel by air, as the present times of arrival and departure make it very awkward to get a meal within the lunch limitations.

Incidentally judging from the way the machine was bumped about, one would not have been surprised if there had been more food in the machine at the start of the flight than at the finish.

At Christmas time Mr. Handley Page presented Mr. Coleman with £5 for distribution among the London Terminal Aerodrome traffic hands. One was sorry to note that other air line directors decided to pass over the event without recognising in any way those who work so hard on their behalves.

### GENERAL FLYING.

On the Friday before Christmas Mr. Woods-Humphrey of Daimler Hire (Aircraft) Ltd. visited the aerodrome accompanied by Mijneer Fokker. The latter did not look too

pleased to see the British and French air lines carrying on while his own has had to suspend during the winter.

Early the same day a Spad made a remarkably fine and well-judged landing, coming right up on to the Tarmac without having to use his engine after touching.

Mr. Muir has made several trips to Brussels on Disposal Co. machines and on Thursday he tried on a 300-h.p. Bristol to lower his 83 min. record on a D.H.9 for the trip. The wind in the Channel was across him so he was only able to do the trip in 94 minutes.

Mr. Aleu Cobham called at the aerodrome on a flight from Barcelona whence he came in a D.H.9 for Christmas.

The pilots at the aerodrome would be very grateful to the Aircraft Disposal Co. if they would erect a wind vane on their building. When coming in in bad weather pilots have to make a whole circuit to see the one on the Customs House.

Mr. Hall of Napier is building unto himself a dwelling house in Plough Lane. He is uncertain at present whether to call it just "The Hall" or the "Lions' Den."

Crown Hill, which is where George Street and North End meet in Croydon, was apparently in eruption last week and was most detrimental to feet when returning to the aerodrome.

One is told that the latest pastime for pilots who have forced landings is the weaving of mats. It is believed that these are intended to be added to the stock of the traditional bottom drawer.

The fence surrounding the aerodrome continues to grow. Although a large piece of the aerodrome has been subtracted from the northern end of the aerodrome, a piece the corresponding size is being added at the southern end, though why some 60 yards frontage is being subtracted from the Eastern side is more than one can say. The run from East to West as it is none too much and should houses be built on that 60 yards it will be nothing short of criminal, as it will make a second Cricklewood of the place. In fact it looks as if future geography books will define an aerodrome as "a small patch of grass entirely surrounded by bricks."—G. D.

### Weather Reports for Cross-Channel Passengers.

The Air Ministry announces in Communiqué No. 743:—

"The Meteorological Office of the Air Ministry has arranged with Messrs. W. H. Smith and Son for a Daily Weather Report giving special forecasts of the Channel crossings (Folkestone-Boulogne; Dover-Ostend) to be on sale at Victoria on the departure platforms of the 2 p.m. trains.

"These reports give a complete weather chart and other information and will enable readers to know beforehand what kind of crossing they may expect. Reports will not be on sale on Sundays nor on Monday and Tuesday, Dec. 26th, 27th."

[Evidently the Meteorological Office of the Air Ministry realises that so long as the Department of Civil Aviation of the Air Ministry continues to subsidise aeroplanes of four-year-old design instead of building up-to-date machines and organising a proper ground-communication Service the average sane person will prefer to travel by train and boat.—Ed.]

### Leatherhead.

In spite of the fact that one hears little of the doings of Mr. W. E. Chapman, he is still actively interested in flying, and contemplates big things in the coming year. He has recently acquired a new Hewlett and Blondeau built Avro, and by way of a holiday used it to fly to Kidderminster just before Christmas. He left his aerodrome at Byhurst Farm, Chesham, at midday Saturday, and dropped in near the Caversham Bridge Hotel for lunch. Finding it rather late on getting away, it was decided to make for Cheltenham, where the night was passed. On the following morning Kidderminster was made in about 45 minutes. On the following day, a little stunting was indulged in, and on Thursday a return was made to Leatherhead, the journey being accomplished, non-stop, in 65 minutes. The whole trip was a "no-trouble" one and was an excellent example of what can be done in aerial touring with an efficient machine.

Mr. Chapman is at present concerned with the pilot question, and he would be pleased to hear from anyone who is willing to assist him conscientiously during the coming season on a profit-sharing basis.

### Porthill.

Mr. O. P. Jones of the Berkshire Aviation Tours has just concluded a nine days' visit to Porthill, near Stoke-on-Trent. Almost continuous gales and rain made things somewhat lively, but in spite of this he carried 90 passengers.

On New Year's day the wind was such that he could go on climbing to any height without moving forward at all and turning down wind he "bameled" along at what looked like 212 m.p.h.

On Christmas Day itself, Mr. Jones worked the "Father Christmas arriving by air with presents" stunt and distributed ninety toys to the children who had assembled in force to greet him.

## INDEX TO ADVERTISERS

Aecies & Pollock, Ltd. ....	14	De Havilland Aircraft Co., Ltd., The... ..	14	Rolls-Royce, Ltd. ....	...
Aircraft Disposal Co., Ltd. ....	Back Cover	Fairey Aviation Co., Ltd., The ... ..	5	Rubery, Owen & Co. ....	20
Bray, Gibb & Co., Ltd. ....	Front Cover	Godfree, E., & Co. ....	17	Shell-Mex, Ltd. ....	13
Bristol Aeroplane Co., Ltd. ....	Back Cover	Instone Air Line ....	18	Tait-Cox and James ....	20
Brown Brothers, Ltd. ....	14	Palmer Tyre, Ltd. ....	Inside Back Cover	Titanium, Ltd. ....	Front Cover & 6
Cunard Line ....	20	Roe, A. V., & Co., Ltd. ....	Inside Front Cover	Vickers, Ltd....	11

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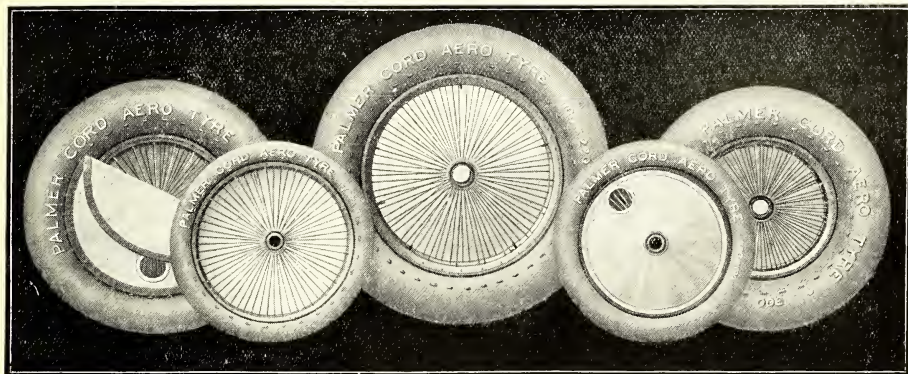
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WEDNESDAY, JAN. 11, 1922.

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## "THE STILL-VEXED BERMOODHES."



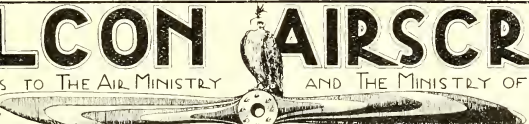
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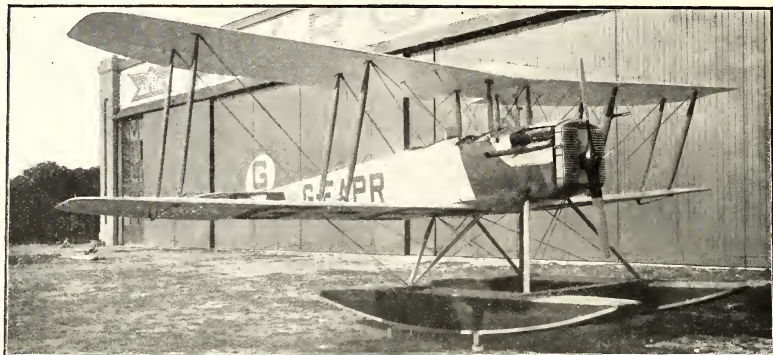
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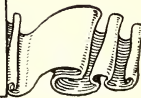
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## ON OUR FIRST LINE OF DEFENCE.

### The Navy in the Open.

"The Lord hath delivered mine enemy into mine hand," sang the Psalmist or Gideon or one of those jolly old things in Ancient Hebrew history who used to "wade into the melée, and pound his opponents to a jelly" or words to that effect. That is somewhat how one feels now that the Navy has at last come into the open and started its attack on the R.A.F., firing the first shot in the *Pall Mall Gazette* on Jan. 5th, 1922—a really happy beginning for the New Year.

Probably not so many people read the *Pall Mall* as ought to do so, but its sales must have gone up with a jump on Thursday evening when it came out with its posters screaming "CHAOS IN THE AIR FORCE." For, queer as it may seem to the British shopkeeper who refuses to put money into aviation, the ordinary more or less intelligent voter already regards the R.A.F. as our first line of defence, and quite a lot of the said voters rushed to buy *Pall Malls* to see what was wrong.

What the buyers found was a wonderful series of mis-statements apparently written by a member of the newspaper's staff at the instigation of some mutinous officer in the King's Service to whom the writer of the article refers as "one of our highest authorities" and as "a distinguished officer." It would even seem that this instigator is actually a traitorous R.A.F. officer, for in reporting his utterances the article makes him deliver such phrases as "If we can never work effectively," "If we are the most technical service," "If we have no technical or professional executive departments." One can only hope that the duly constituted authorities of the R.A.F. have been able to lay by the heels this maligner of the King's Premier Service and will in due course bring him to the Court Martial which he so richly deserves.

In the ordinary way the grouching of disgruntled inefficient can be ignored by the Service Authorities. There are even times when officers are justified in helping quietly in public agitations for the betterment of their Service, as for example when the Admiralty and the War Office so mishandled the Flying Services in 1915 as to cause the agitation which produced the Air Enquiry of 1916. But when an obviously incompetent or ignorant officer delivers himself publicly, though anonymously, of a series of libels on his own Service and on his own senior officers and when it is common knowledge that the said libels are part of an agitation backed by a rival and notoriously inefficient Service it is time the offender was caught and convicted under the various Regulations which he has broken.

### Lying Charges.

Among the lying charges made in the article are the following:—(a) "There is a 20 per cent. efficiency only in the R.A.F.," (b) "To-day progress is at a standstill and waste is rampant," (c) "The effective influence of the naval partnership has become nothing more than a figure of speech," (d) "The internal organisation of the Air Force is thoroughly unsatisfactory and the whole atmosphere is bad," (e) "Naval needs have been treated with appalling indifference owing to the self-satisfied attitude of the chiefs of the R.A.F.," (f) "We are ignoring the lessons to be learned from our sister Services," (g) "The present research methods are all wrong."

In the ordinary way one would ignore such futile and foolish libels, by any officer or man of experience can refute for himself. But there are in the R.A.F. to-day a large number of young men who may not feel competent to answer on their own accounts these charges when thrown at them by friends and relatives. Therefore it seems well to give brief answers on these points.

### And the Answers.

(a) The R.A.F. is in fact highly efficient. Witness the flying of the pilots at the various pageants, which proves the efficiency of pilots, mechanics, stores, workshops, etc. Witness also the march-discipline and parade deportment of the "troops" on ceremonial occasions. Witness also the work of the R.A.F. in war in Russia, India, Iraq, and especially in Somaliland, where the R.A.F. did in six weeks what the Navy and Army had failed to do in fourteen years.

(b) Progress is rapid in all departments, as is shown by the fact that though the R.A.F. was left in a state of chaos by the cessation of hostilities and no reforms could begin till the Peace Treaty was signed in 1919 to-day, only two years and a half later, the R.A.F. is smarter, better organised, and better equipped than either of the Senior Services. Remember that almost all the best mechanics returned to civil life and a complete new personnel has had to be trained. Remember that a very large proportion of the best pilots and best officers also returned to civil life and the younger men have had to learn their jobs. Remember that owing to lack of money the R.A.F. has had to carry on with aeroplanes and engines designed in 1916 or 1917 and built during the War. In spite of all this the R.A.F. is the finest air force in the World to-day. Is not that real progress?

(c) "The effective influence of the naval partnership" has been continually a clog on the progress of the R.A.F. It has made for inefficiency, slowness, and many other evil qualities. Yet in spite of it the chiefs of the R.A.F. have been loyal to the Navy, as is shown by the fact that far more flying has been done in co-operation with the Navy (in the hope of enlightening that hide-bound Service) than has been done in any other branch of Home Service.

(d) The internal organisation, which was very bad at the end of the War because of the number of inexperienced civilians and inefficient Naval officers employed at the Air Ministry, has improved wonderfully, and to-day the Staff work is really well done. And, considering the chaotic state of the R.A.F. when it was taken over at the end of the War, its tone to-day is very high indeed, but for certain spots in which a bad atmosphere has been created by officers of a type precisely similar to that one who is responsible for the article under review. Happily such people are being steadily eliminated.

(e) Naval needs have been considered more than any other, as is proved by the fact that almost all the time and money of the technical department has been spent on producing dock-flying machines, amphibians, fleet-spotters, torpedo-droppers and so forth. Owing to shortage of money very little has been done to develop aeroplanes for land war or Army co-operation, and if any Service has a grievance on the score of neglect by the chiefs of the R.A.F. it is the Army which is being served by R.A.F. units equipped with obsolete war-machines.

(f) The R.A.F. Staff has assimilated carefully everything that has been proved best in the "sister Services"—one might, with memories of Cinderella, call them "step-sister Services." It is true that there is a tendency towards Army customs and manners, but that is merely because the manners and customs of the Navy do not commend themselves to the best people, and because the Navy was such an ardent failure in the War that the R.A.F. has nothing to learn from it. In fact what little good the Navy did in the War was either done by the despised R.N.A.S. or was forced upon it by the lessons of air war.

(g) Considering the small amount of money available the Research Department has done splendid work. The new machines produced for naval war are far ahead of those of any other nation. The new bomb-sights and bombs are immensely superior to those elsewhere. Every aeroplane firm or engine firm which has put up a proposition worthy of consideration has been encouraged as generously as the Nation's finance permitted. And where more might have been done the fault certainly does not lie with the late Director of Research or his subordinates. In fact the Research Department has been and is one of the most efficient, economical, intelligent, and progressive departments in any of the King's Services.

So much then for the statements of this creature who has attempted to foul his own nest. From the nature and style of his statements one judges that he fancies himself to be a technical man. If so one can only believe that if he does happen to be a regular officer of any Service he belongs intellectually to the class of those crazy inventors who because wiser men than they are able to see the silliness of their inventions and refuse to spend money on them charge those

wiser men with stupidity and malice and dishonesty. One met hundreds of them during the War and one hoped that by now they had all starved to death. It seems that one at any rate has survived.

#### The Admiralty's Motive.

That being so, what is to be said of the Naval officers and *ex officio* gentlemen who have used this mean weapon to attack the R.A.F. and what is their underlying motive? The key is found in the *Pall Mall* article in the phrase "The Admiralty are seriously concerned."

Small wonder that the Admiralty are seriously concerned for those of their Lordships who retain the remnants of intelligence realise that the Navy as the Empire's first line of defence is obsolete. As one has said on various occasions we shall always need a Navy and the capital ship—on whatever lines it may develop—will always be as necessary as the infantryman will be to the Army. But the Navy in future will decline to the position of a sea-patrol force and a little expeditionary force, just as before the War the Army had become a land police force with a small but highly efficient striking force.

For over a hundred years the Navy has been the spoil child of the British Nation. When it wanted money it got it. And because it could have money for the asking it became wasteful and inefficient. Also because it has been supreme at sea ever since the Battle of Trafalgar it ceased to develop its brains, as any clever engineer or submarine officer will admit in moments of expansion.

Consequently when the War came the Navy proved itself an abject failure. The junior officers and men were as brave as were any others of the King's servants, but they lacked education even at their own jobs. Initiative was poor. Gunnery was deplorable. But they fought magnificently when they had the opportunity.

#### The Navy's Failure.

The real cause of failure was in the higher ranks and in the Admiralty itself. The Navy failed to force the Dardanelles when by losing a few ships Constantinople could have been captured and Turkey could have been kept out of the War, thus saving all the lives and money lost in Mesopotamia and the Near East. The Navy let the Germans sink the *Lusitania* in spite of the fairest of warnings from the German Admiralty. The Navy let the Irish mail steamer *Leinster* be sunk in sight of Kingstown Harbour and took an hour to reach the place where she sank.

The Navy lost ship after ship out of convoys committed to its care long after the R.N.A.S. had proved that air escort was a positive guarantee against such loss. The Navy compelled food ships to remain outside British harbours to be sunk there when any intelligent person would have brought them in to safety. The Navy failed utterly to overcome the German submarines with the result that Great Britain was on the verge of starvation when the R.A.F. came into being and organised proper coast patrols—which had to be done on landing aeroplanes because the Navy had not built adequate seagoing aircraft.

The Navy was responsible for the defence of Great Britain and allowed German aeroplanes and airships to come over unmolested. Such enemy aircraft as were destroyed were brought down by the R.F.C. and the Royal Regiment of Artillery, until such time as the R.A.F. was formed and until General Ashmore organised the London Air Defence Area and in a few months utterly defeated the German invaders. The Navy was even specifically charged with anti-aircraft work and failed miserably.

The Navy allowed the German Fleet to make tip-and-run raids on British coast towns and failed to catch the hostile ships, all of which could have been torpedoed long before reaching the coast if our pre-war torpedo aircraft had been developed. The Navy had the chance of annihilating the much inferior but highly efficient German Fleet at the Battle of Jutland and failed there as miserably as it did in everything it undertook during the War.

Whatever good work was done during the War by men in Naval uniform was done by a few intelligent and daring junior officers and by a vast crowd of officers and men of the Mercantile Marine, amateur yachtsmen, trawlers, people of little coasting ships and so forth. The Royal Navy itself was an utter, lamentable, hopeless, dire and complete wash-out. Considered as a failure it was the greatest success of the War.

#### A Point of Honour.

Knowing all this and knowing that the future defence of the British Empire depends on its aircraft the Admiralty is naturally "seriously concerned" at finding a smart and highly efficient Royal Air Force arising so quickly from the chaotic ashes of 1919. But one cannot help being just a little surly at even the Navy using such a singularly dirty method of attack as a series of lies in the public Press produced by a disloyal or demented officer of the Royal Air Force and transmitted to the Press by a Naval officer.

It is morally far worse than if the said R.A.F. officer had gone straight to the newspaper himself. Moreover, one would not be at all surprised to hear that the Navy sent those statements to the newspaper without the knowledge of the R.A.F. officer concerned. Which, however, does not in the least excuse the culprit who sent such disloyal statements to a rival Service.

Therefore it is to be hoped that for the honour of the R.A.F. he may be duly court-martialled and cashiered, and that the Authorities will not merely allow him to resign, as doubtless might be the inclination of some of those kindly senior officers who rule the R.A.F. and would hate to have it thought that they took action because their own departments were attacked. Also it is to be hoped that sufficient sense of decency remains in the Admiralty to cause the cashiering of the Naval officer concerned in this gross breach of discipline.

#### Naval Intelligence.

To bolster up the attack the *Pall Mall* published also on Jan. 5th an article by Rear-Admiral Sir W. R. Hall, K.C.M.G., C.B., M.P., who during the War was Director of Intelligence at the Admiralty, and afterwards descended to becoming a Member of Parliament. He starts by decrying the effectiveness of the aeroplane and airship. He says the recent U.S. experiments did not reproduce the conditions of war (which is true but misleading as it begs the question): that "the aeroplane has not a fraction of the mobility of surface craft (which is merely funny): that it can only keep the air in certain weather conditions (which is equally true of ships, keeping the sea, at any rate the Flying Services kept in the air a lot more than the British Fleet kept out on the sea during the war). He ignores, if he has heard of, the R.A.F.'s attack on H.M.S. *Agamemnon*, when that ship was under steam and dodging about under wireless control, despite which she was hit by many bombs, some of which actually went down her funnels.

And after all that he says "aircraft are vitally necessary to the Navy" and "naval air machines are as much parts of a ship's armament as are guns, torpedoes, etc.," and finally "If aircraft are eventually to take the place of surface ships, this day will come sooner if the Navy is allowed to develop sea aircraft. For one thing naval officers will be under less temptation to be narrow-minded when the stage is reached where it really looks as though the surface ship was taking a back place; secondly it stands to reason that the right type of craft for work over the water is much more likely to be evolved by the purely sailor-airman than by the all-round airman." Which last statement is the funniest of the lot.

During the War, thanks to Admiral Hall, Admiralty Intelligence was perhaps the best in the World, and certainly the best thing in the Navy, though the intelligence of the Admiralty—which is quite a different affair—was rather below that of the average Hottentot. Judging from the article quoted, Admiral Hall has scarcely maintained his own personal intelligence on a war footing.

Surely he knows enough of the average Naval officer (whom he himself admits to be narrow-minded, though most people would merely call it pig-headed ignorance) to realise that the last person in the World who is likely to produce the right type of seagoing aircraft is the sailor of any rank or branch. The whole history of the Navy is one long record of intelligent people breaking their heads and their hearts against the implacable prejudices and abysmal ignorance of Naval officers in the patriotic hope of improving the Navy. And the last people who would go back to the Navy at any price are the former Naval officers who came into the R.A.F. via the R.N.A.S. and have made good there.

#### Some Other Views.

To do the *Pall Mall* justice it must be said that on Jan. 6th it published an excellent article by Major Wilfred Blake, late R.A.F., better known as "Wing Adjutant," in which he lays out quite effectively the fallacies in the original article and refers to Admiral Hall's article as "an expression of opinion from a retired officer of an obsolescent Service"—quite a good phrase.

Also he states (presumably on good authority) that "a British naval representative at the (Washington) Conference wrote home to the effect that the day of the Navy was over and that the future lay with the R.A.F.," and adds "This is also a very simple explanation of the desire of the Admiralty to take over the R.A.F. The truth of the matter is that the R.A.F. is just coming to life, while the Navy is dying, and the Admiralty knows this." Never in his life has "Wing Adjutant" done better work than this letter in the *Pall Mall*.

There was also on the same day an article by Lieut.-Col. Finch-Noyes, late R.A.F., who will be remembered as commanding at Killingsholme about the period when a private war was in progress between the local R.A.F. and a force of attached personnel of the U.S. Naval Air Service. Col. Finch-Noyes is apparently all out for reforms in the R.A.F.

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Constructeurs, sur commande  
spéciale du Gouvernement Britan-  
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lant construit jusqu'à ce jour.

Etude et entreprise de la fourni-  
ture du matériel complet pour  
services de transport aérien rapide  
de passagers, postes et mar-  
chandises. Constructeurs des  
Fairey Type III. Série de machines  
fournies en grandes quantités au  
Gouvernement Britannique pen-  
dant la guerre et depuis la cessa-  
tion des hostilités. Dans cette  
série de machines, le fuselage, le  
plan central et la queue, etc., sont  
de type normal, et sont construits  
de manière à pouvoir recevoir des  
ailes de types différents, ainsi que  
des châssis et moteurs d'autres  
machines de la série, de manière  
à être appropriés à l'usage auquel  
la machine est destinée dans  
chaque cas particulier. Toutes les  
machines de cette série ont des  
ailes démontables et repliables et  
sont munies de notre dispositif  
breveté de cambrure variable, qui  
permet les plus grandes perfor-  
mances et qui combine une grande  
puissance de soulèvement avec une  
faible vitesse d'atterrissage.

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cialmente adecuados para el  
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suministrados en grandes can-  
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de su terminación. En esta  
serie de aparatos, el fuselage,  
el plano central y la unidad  
de la cola, son de tipo normal y  
fabricados para adaptarse a di-  
ferentes tipos de alas, chassis y  
motores de otros aparatos de serie  
que sean adecuadas para los fines  
particulares a que se destina el  
aparato en cada caso. Todas  
las máquinas de este tipo,  
tienen alas plegadizas y están  
provistas del dispositivo patentado  
de combo variable Fairey que da  
una alta capacidad y potencia de  
ascensión combinada con una  
velocidad baja de aterrizaje.



and it may console him to know that the reforms which he advocates so strongly have been in progress in the R.A.F.—at any rate such of them as are advisable—for a long time.

He talks a certain amount of nonsense, but his general ideas are sound. And having been out of the R.A.F. for some time he cannot be expected to know what has been going on behind the scenes since he left. He is, however, quite sound on the R.A.F. being our first line of defence.

To balance these articles the "Naval Correspondent" of the *Pall Mall* published on the same day an article entitled "The Navy Must Fly!" which contained rather more nonsense to the square mile than anything that has been printed on air affairs for the last year or so. The chief argument seemed to be that "It is the duty of the Admiralty to protect our commerce. Therefore the Navy must fly." To which the answer very simply is: The Admiralty failed miserably to protect our commerce during the last War. Therefore the job must be given to a more intelligent authority before the next war so as to make quite sure that the Admiralty does not make a mess of things next time. Consequently the Admiralty must not be allowed to touch the operation of aircraft.

### Admiral Lambert's Counter Attack.

But by far the most pleasing feature of the whole controversy is the very able letter from Rear-Admiral Sir Cecil Lambert, lately Director of Personnel at the Air Ministry, published in the *Pall Mall* of Jan. 7th. It has been thought very generally in the R.A.F. that Admiral Lambert was not a very firm believer in the R.A.F., or at any rate that being a senior Naval officer he did not understand either the capabilities or possibilities of the R.A.F. His letter shows him to be a very true and loyal friend of the Air Force.

He details the great success of the R.A.F. during and since the War and finally crushes the Admiralty thus: "There are many Naval officers who watch the progress being made by the Air Force with alarm and who clamour for the reorganisation of a Royal Naval Air Service. The answer is: It might have been and perhaps it may be, but the signs of the times seem to indicate that the day is past. There are practically no Naval officers with any knowledge of airman-ship, but this is in no way the fault of the Air Ministry. The Admiralty were asked to lend or second a quota of officers each year for four years' training in aviation. The offer was refused on the inadequate ground that Naval officers could not be spared so long away from the sea. On the other hand arrangements have been made for ensuring that Air Force personnel shall remain with the units employed in co-operation with the Navy for a period of four years, and thus efficiency is secured."

In other words the Admiralty has refused, within the last few months, to let the R.A.F. make sailors into aviators, so in order to ensure the continuity of Naval air work, the Air Ministry is deliberately turning some of its own personnel into sailors. After that who can argue as to whether the Air Ministry or the Admiralty is the more worthy to organise and operate our first line of defence?

Admiral Lambert concludes: "Evidence is accumulating to show that the safety of this Kingdom must in the future chiefly depend on the Air Force, and they (the public) should not allow their judgment to be warped by the delirious screams of those who, for diverse reasons, wish it were otherwise." One desires, in all humility, to thank Sir Cecil Lambert for his able and opportune contribution to this debate, and one wishes that his letter could have appeared in every newspaper in the country.

### A Parthenogenetic Staff.

Finally the *Pall Mall*, with the best intentions in the World, contrives to make a complete ass of itself. It says, "The Air Force at the moment is being dominated and crippled by the old evil tradition of the War Office and the Army martinet. On the other hand there is an attempt to bring it under the

control of the Navy, a force which is rapidly becoming obsolete. . . . The only way to save the Force is to withdraw it from all alien influences and constitute it as the first and most important of the fighting Services. There is ample material. From the ranks of the distinguished flying men now occupying subordinate positions in the Air Ministry there could be formed a General Staff which if given a free hand could soon remedy the mischief that has been done since the Armistice."

And may one ask where these distinguished flying men have learned anything of the science of war or of the work of a General Staff? Certain R.A.F. officers have passed through the Army Staff College at Camberley, but they were all regular officers of the Royal Marines or Army before the R.A.F. existed. None of the civilians who came into the R.A.F. or R.N.A.S. during the War have had any training in Staff work. The new R.A.F. Staff College at Andover has been formed precisely so that R.A.F. Officers who have not been in the Senior Services may be trained to be Staff officers of the R.A.F.

The distinguished flying man as a rule is the last man capable of doing Staff work. He has been too busy flying to learn anything except the rudimentary tactics of air fighting. He needs three or four years with his nose glued to Clausewitz, Hamley and Henderson, with Mahan as a light interlude, before he can begin to think of being a Staff officer, or, for the matter of that, anything else except a species of glorified chauffeur or chief mechanic or head clerk.

### The Future Commands.

It is really rather a pity that the editor of the *Pall Mall* should have allowed that silly paragraph to be printed, for his general idea is sound. In due time the R.A.F. will be staffed from top to bottom by officers who have been bred and brought up in the R.A.F., but it must be twenty years at least before the Chief of the Air Staff or even the senior Air Officer Commanding an area can be an officer who has not been in either the Navy or the Army but only in the R.A.F.

Such posts can scarcely be held in time of peace by a man under forty years of age, and where is there in the R.A.F. a man of twenty or more who has not served in the R.N.A.S. or R.F.C. and who is ever likely to rise to high rank? In time of war it is more likely that the high commands in the Air Force will be held by men of sixty or more, for, be it remembered, one of the greatest lessons of the recent war has been that the young generals nearly always failed and that the greatest victories were won by men of fifty years of age or more. It is only age which gives experience and judgment. The young man may be a great leader of men, it is only the old man who can direct.

### A Service to the R.A.F.

Still, whatever may be its own mistakes, the *Pall Mall* deserves thanks for thus bringing the Navy into the open and disclosing the Admiralty's line of attack. The controversy has done valuable work in convincing people that the R.A.F. is in truth the first Line of Defence of the British Empire.

One has already noticed that the ordinarily intelligent citizen and, naturally, the intuitive citizenship (with her vote) has come to this same conclusion. Therefore it is earnestly to be hoped that the Admiralty will carry out its threat implied in the first article, namely "The demand is that when Parliament again meets a Commission should be appointed to examine into the whole position."

A good Parliamentary debate on Air Defence would be the finest thing in the World for the R.A.F. There are now enough Members of Parliament with real air experience to make a first-class fight for the Air Force, and the result of such a debate could only be to strengthen the position of the Air Ministry and to establish still more firmly in the mind of the British public the idea that for the future the R.A.F. is its sure shield.—C. G. G.

control and co-ordinate the supply and operations of the three Services.

### AT WASHINGTON.

Renter's correspondent at Washington telegraphed on Jan. 9th that the representatives of the Five Powers, having come to the conclusion that it is impossible at present to limit the development or the use of aircraft, that day adopted a resolution recommending the creation of an International Commission to study the question with a view to future limitation. The Committee adopted substantially the report of the Sub-Committee, which found that to limit aircraft would retard commercial development. The resolution adopted provides that a Commission, comprising aviation and other technical as well as legal experts, shall study the whole problem.

[Meantime, while the International Committee is considering matters for the next two or three years, let us set to work and build up an invincible air force for the defence of the British Empire.—C. G. G.]

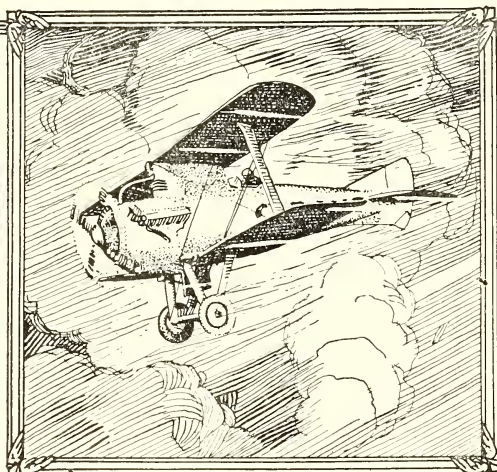
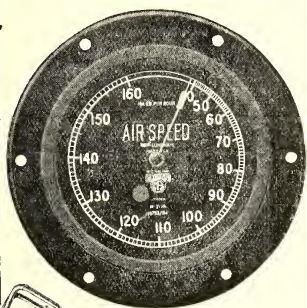
### GOOD NEWS.

The following announcement was issued from the Colonial Office on Jan. 9th:—

The Cabinet Committee appointed under the chairmanship of Mr. Churchill to consider the Cabinet on the recommendations in the Geddes Committee Report affecting the Navy, Army, and Royal Air Force had a preliminary meeting to-day at the Colonial Office. Representatives of the Admiralty attended the meeting. The Committee is not yet complete, but the names will be published in a day or two.

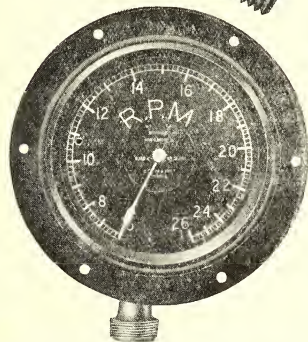
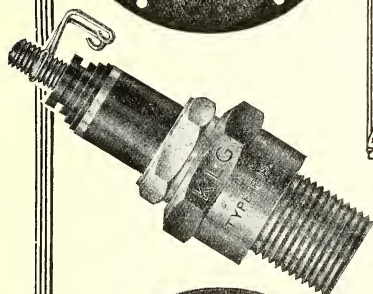
That is the best possible good news for the Royal Air Force. Mr. Churchill may justly be considered the founder of our Command of the Air during the War, because of his support of the British Aircraft Industry before the War when First Lord of the Admiralty. He has from the first been a firm believer in Air Power and is himself a capable aviator. Also he is strongly inclined towards a single Ministry of Defence to

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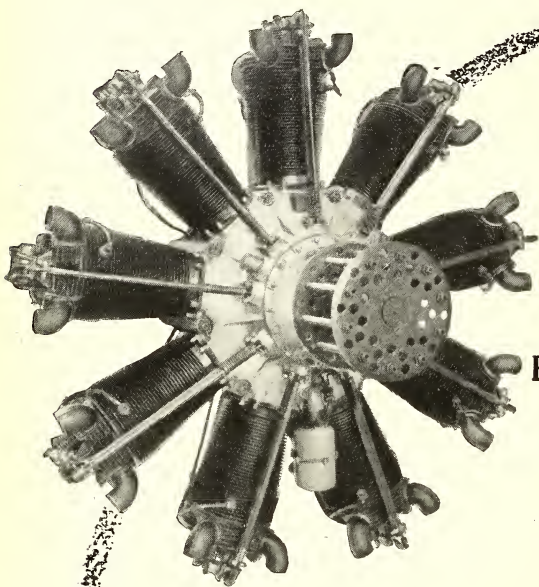
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*Mr. H. Massac Buist, writing in "The Morning Post," states:—*

"For its weight, including fuel and oil consumption, the "Bristol" Jupiter engine represents the most powerful achievement by the radial aircooled type to date, its outstanding merit being economy . . . the capabilities of the "Bristol" Jupiter engine have long been known. What has occurred recently is merely a confirmation, by an Air Ministry Test, of the high opinion many experts have long held concerning this interesting type of power plant which, it is gratifying to note, is entirely a British proposition."



# AERONAUTICAL ENGINEERING

## SUPPLEMENT TO "THE AEROPLANE"

INCORPORATING AIRCRAFT ENGINEERING, AERODYNAMICS, AIRCRAFT FINANCE AND COMMERCIAL AERONAUTICS AND MATTERS PERTAINING TO THE AERONAUTICAL ENGINEER AND THE AIRCRAFT TRADER.

### THE WEEKLY COMMENTARY.

A very important paper by Wing Commander Beatty of the Department of Civil Aviation, read before the Royal Aeronautical Society, is given in abstract below. The title—"Specialised Aircraft"—scarcely indicates the scope thereof, for the paper is mainly concerned with the subject of the comfort of the unfortunate passengers on commercial aircraft.

A very large number of those who have had a long experience of flying under war and pre-war conditions have a very strong objection to suffering under the conditions obtaining in the majority of present-day commercial aeroplanes. It is probable that some proportion of this objection is on grounds other than those of comfort, but, as a matter of fact, the majority of cabins are less comfortable than the war type of open cockpit.

It is fairly obvious that one can scarcely expect the

passenger who pays heavily for air transport to tolerate conditions which those who are used to flying in open machines find objectionable, and that this question is one of very great importance.

There are a number of points raised in the paper which will bear further consideration, and in next week's issue it is hoped to deal with these, in conjunction with the remarks made by various speakers in the discussion.

A very interesting American flying-boat, designed by Mr. Grover C. Loening, is described hereafter. Mr. Loening has a very useful capacity for appreciating the good points of other people's design and of utilising those good points in connection with original ideas of his own, so that it is scarcely surprising to note some traces of Dornier influence in this machine.

### THE PROBLEM OF THE PASSENGER AEROPLANE.

On Thursday, Jan. 5th, Wing Commander W. D. Beatty, C.B.E., A.F.C., read a paper under the title "Specialised Aircraft" before the Royal Aeronautical Society.

The lecturer pointed out that till very recently the development of heavier-than-air craft had been entirely on military lines. The first serious effort to obtain aircraft for a definite use in England was made ten years ago, when the War Office published the conditions for the Military Trials Competition held in the Summer of 1912. These conditions called for two-seaters carrying 350 lb., with  $\frac{1}{2}$  hours' fuel, at a speed of not less than 55 m.p.h., to climb 1,000 ft. in 5 min. and to glide at 1 in 6.

The main conditions would be child's play to any present-day aircraft designer, but some of the desirable attributes are not even yet incorporated in modern machines, though their desirability has certainly not decreased.

The attributes still lacking called for on that occasion were the following:—

Effective silence and self-starter. Neither of these are yet standard, though beginnings have been made to the supplying of these needs.

Ease of control. Considerable progress has been made in this direction, but judging by the amount of experimental work frequently found necessary to secure decent controllability on new types there is room for improvement.

Wide range of speed. Here again progress is still to be hoped for.

Good glide, with wide range of angle of descent. This is generally satisfactory, but difficulties such as sudden stalling at small decreases of speed are still occasionally met.

Ease of assembly. Here there is still room for much improvement.

Stability in flight. Much progress has been made, but much yet remains to be done.

At the time the conditions were published they were criticised as being too severe, but of 25 competitors ten were actually placed in order of merit, and the first five were not specially designed for the contest. The requirements called for were in fact primarily those of a satisfactory aeroplane, and only secondarily military requirements.

#### THE MILITARY DEVELOPMENT OF THE AEROPLANE.

At the outbreak of war the British Army was equipped with such general utility machines, for until experience had been gained in actual war the lines on which improvement was most urgently needed could not be determined.

With war as instructor knowledge came rapidly and the design of aircraft for special purposes made very rapid strides. Six years after the military trials, at the end of the war, speed had increased from the maximum of 75 m.p.h. at

ground level (Hanriot monoplane 1912) to 142 m.p.h. at 10,000 ft. (Martinsyde F.4), climb from 1,000 ft. in 2.7 min. (Hanriot) to 10,000 in 6.7 min. (F.4). Large bombers carrying total loads of 8,600 lb., had speeds at 6,500 ft. of 90 m.p.h. The satisfactory working of "this powerful engine" (120-h.p. Austro-Daimler) in Cody's machine of 1912 was subject of comment by the judges. In 1918 engines of 300 h.p. were used in single-seaters, and to-day engines of 600- to 750-h.p. are in use and the 1,000-h.p. unit is well on its way.

#### THE BEGINNING OF COMMERCIAL DEVELOPMENT.

It was not till much knowledge had been gained through the forced development of war that aeronautics reached a point where it could usefully play a part in the business of the world, and even when peace came the enthusiasts knew little of how best to use their knowledge. In England, the short distances and the highly developed existing communications by road and rail offered few prospects of attaining sufficient traffic for the new and untried form of conveyance.

The cross-Channel routes alone offered a reasonable prospect of paying traffic for a regular service, and it was to these that serious attention was devoted. The first services were operated with machines of war type, variously modified. The demand for machines specially designed very soon made itself felt. Although aerodynamic requirements are similar for both war and civil machines the commercial importance of certain details of design forces on their improvement in a way which the wasteful habits of war failed to do.

With the pounds available in peace for the evolution of new designs compared to the millions of war time, progress is inevitably slow, and in commercial design we are now at a stage comparable to that in military design at the period when slow two-seaters armed with a rifle or a stripped Lewis gun carried on the general air work of the Army.

The real commercial machine has not yet been developed. Progress has been made in the right direction, as evidenced by some of the existing commercial types.

It may be said that under conditions less difficult than those of the Continental routes existing types are commercial propositions. Perhaps so: the camel may be a commercial means of transport in Eastern deserts, but not for world-wide purposes, and it is for world-wide communications that aircraft must be used if they are to fulfil their obvious destiny.

Constructors will be forced to realise that their job is to meet the users' wishes to the best of their ability, and not to provide him with their own idea of what is just as good. In war the user was under orders and had to use what was supplied. Fears of delay in output were urged and frequently accepted as a reason why the "just as good" should be made to do. In commerce if the user is not satisfied—and user

here means both the operating firm and the paying traffic—the transport firm will lose traffic and the constructor orders. One way of studying the users' view of his machines is to study them from the point of view of the profit and loss account of the operator. It is obviously desirable to reduce expenditure, therefore among the qualities required of the specialised commercial machine are (1) low first cost, (2) economy of maintenance, (3) economy of operation.

#### THE DESIGN OF DETAIL.

Careful design can simplify manufacture and avoid expensive fittings. Strength, not only from the safety point of view but also in the form of resistance to wear and tear, is necessary. Moving parts and friction between them must be reduced to the minimum. Accessibility of parts needing attention is of high importance. The engine in particular must be readily removable, either by itself or complete with its mounting.

The engine itself should be capable of running long periods without overhaul. At present we are getting near to 100 hours between overhauls, but 300 to 500 was needed as a normal running period.

#### THE PASSENGER.

But in addition to the costs side of the account there is the receipts side. A representative of an operating firm has already given in detail his requirements, therefore that side may be left for the moment and discuss the requirements of the other users of aircraft, that is, the passengers.

Far more attention to the comfort of passengers is needed. A considerable advance in forthcoming commercial machines might be made if designers were to travel to and from Paris in each of the types now used on the cross-channel services. Why should not the air lines offer a number of free returns to bona-fide designers during the present slack season, and let them experience in their own vile bodies the various sources of discomfort? Passengers are the most important source of revenue, and each dissatisfied passenger will result in a fall in receipts. A satisfied passenger is a walking advertisement.

#### NOISE.

First and foremost among items affecting comfort is silence. A "desirable attribute" in 1912, it has never been attained in normal practice and the air line passenger suffers acute discomfort from it to-day. Noise comes from a variety of sources, but it is urgent that at least some of it should be eliminated. Promising exhaust silencers have appeared experimentally; it is for designers to incorporate them in their machines. Get rid of the bark of the exhaust and it is possible to identify and then to eliminate other noises. Possibly modification in the design of aircrews will be necessary; with a silenced exhaust it will be possible to compare aircrews for noisiness.

Fabric-covered fuselages should be relegated to the past. A stiff wooden covering does not transmit to the cabin the blows from the slipstream. Vibration and resonance are closely allied to noise in their effect on passengers and should be stopped. It may be necessary to prevent the engines of multiple engine machines from synchronising for this reason. Engine designers must use our experience and get rid of that variety of noises from gears and moving parts which are so obvious on a silenced aero engine.

#### VENTILATION.

Ventilation and heating are the next most important details to be studied by designers. Ventilation is a problem of considerable difficulty. The cubic space is limited so that the air becomes vitiated rapidly. Owing to the speed of flight the incoming air moves so rapidly that passengers complain of draughts. In rough weather therefore passengers tend to suffer from depression, headache, cold and illness.

The supply of air necessary to remove all sensible impurities is generally taken as 3,000 cubic feet per hour per person. In a cabin of 300 cubic feet seating ten passengers the air must be changed 100 times per hour to reach these conditions, which is unattainable except in intolerably draughty

conditions. This ventilation standard is based on keeping the quantity of carbon dioxide in the air below a specified limit, but fortunately Prof. Leonard Hill has shown that the 3,000 cubic feet per hour figure can be greatly reduced if the cooling, drying and radiant energy conditions are satisfactory. Designers should aim at providing some twenty changes of air per hour, taking care to avoid draughts and with adequate heating arrangements.

It is probably preferable to arrange positive removal of foul air. Suitable aspirators drawing from a little above floor level should be fitted, as foul air, unlike hot air, falls. Air inlets should be fitted and cracks and crevices should be sealed. It is essential that incoming air should be free from exhaust gas, petrol fumes and stale oil.

#### HEATING.

It is essential that the cabin be properly warmed. It is possible to supply air heated by the exhaust pipes, but air which has been in contact with metal heated to 200 deg. C. is unfit for human respiration.

Heating by circulating water has been proposed, and was used for foot warmers by Cody in 1912. There are objections to interfering with the water system of the engine, but it should be possible to provide a hot water or steam system heated by the exhaust pipes.

A suggested heating and ventilating system is as follows: Fresh air enters at 3 ft. per second through an opening about 1 ft. square slightly below the roof. Aspirators slightly below the seat level draw air out from the rear of the cabin. An exhaust-heated boiler supplies steam or hot water to a radiator fitted a few inches in front of the fresh air inlet, and to foot-warmers on the cabin floor.

The construction of the cabin is important in this respect also. With fabric covering radiation to the exterior is so great that adequate warming in cold weather is impossible.

#### OTHER QUESTIONS OF COMFORT.

Comfort, warmth and adequate ventilation will remove some of the conditions predisposing to air sickness, but other psychological causes remain. Some thought might profitably be given to keeping passengers' minds occupied. A loud speaking attachment to the wireless telephone allowing passengers to catch remarks passing between pilot and ground might be useful, though steps to tone down some of the language used might be needed. A travelling representative of the transport firm to initiate games of "put and take" or the like might also serve.

The design of passengers' seats deserves attention. If the weight of one's body is carried on too small a portion of one's anatomy that part becomes fatigued, and the whole body becomes uncomfortable. Designers should study the problem in conjunction with anatomists and produce a light chair designed to keep the loading per square inch of flesh low.

#### SINGLE OR MULTIPLE ENGINES.

There is room for much diversity of opinion as to the single engine versus the twin engine or multiple engine machine. While traffic is small the lower first cost and running cost of the single engine machine is in its favour. If the twin engine machine will carry nearly double the load of the single-engine type it at once becomes a serious competitor when the traffic suffices to fill it. The question arises of how large a fuselage is practicable for the single-engine type. There will be a demand for more and more cubic space per passenger. For a 1,000-h.p. engine one should carry at least 22 passengers, and give each at least 40 cubic feet of space. Is such a fuselage practicable for a single-engine machine? How is the air-screw efficiency likely to be affected? These are matters concerning which engine designers would like the views of aeroplane designers, otherwise they may devote attention to engines too large for commercial work.

The development of specialised aircraft on military lines will proceed more and more slowly as less and less money is devoted to military purposes. It is by proving its value to commerce and communication that aviation will really enter on a period of rapid useful development.

#### TOWARDS PASSENGER COMFORT.—

The Bristol ten-seater (Napier "Lion" Engine) now fitted with a two-wheeled undercarriage. This, one of the most recent British commercial craft, has incorporated in its design a number of those features tending to the comfort of the passengers to which the paper above draws attention.



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*The Tatler, 4.1.22.*

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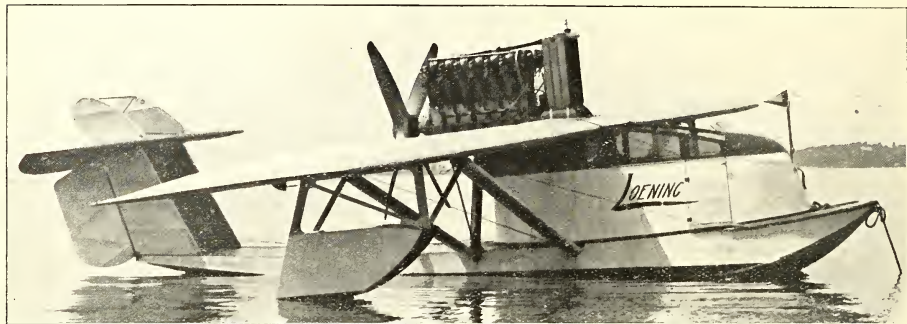
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W.3.



## THE LOENING MODEL 23 "FLYING YACHT."

By "AUSTERLITZ."



A new American seaplane, the design of which marks more than a superficial departure from orthodox practice, recently made a highly successful debut at Port Washington, near New York. The machine, a 5-seater pusher monoplane flying-boat, was built to the designs of Grover C. Loening by the Loening Aeronautical Engineering Corporation of New York, and is officially designated as the Loening Model 23. Unofficially it is also known as the "Flying Yacht."

The new machine is the first American seaplane to be specially designed for civil purposes, and is mainly intended for pleasure uses. With this end in view special attention has been paid in its design to the following points: (1) high performance, (2) seaworthiness and quick take-off, (3) accessibility, (4) minimum encumbrance, and (5) comfort.

These are the points which amateur aircraft owners appear mostly to require, and which they have failed to find embodied in the converted war seaplanes that are glutting the American market. This is incidentally why these wealthy amateurs, nearly all yachtsmen who served in the Naval Air Service during the war, have up to now shown a certain aloofness to "flying boating." Their attitude will be appreciated by those who have desperately tried to "unstick" an under-powered flying-boat, taxiing it up and down a lay for a mile or so before it would stagger into the air.

For most of America's so-called civil seaplanes are very uncivil in this respect. They are under-powered, or overloaded, which after all is the same thing. Now the man who goes into marine flying for the sake of the sport justly demands a better performance than a maximum air speed of 65 or 70 m.p.h., for if he has to buck a 20-mile head-wind his progress become a tedious affair, and furthermore makes a laughing-stock of aviation. He is also entitled to a tolerable amount of comfort, not only for himself, but also for the friends he may want to invite on joy-rides. A cockpit that lacks leg room, where the occupants will be drenched by spray when taxiing, and perhaps soaked with oil when flying, obviously does not answer his requirements. Finally, the real flier—particularly if he has had experience with high performance single- or two-seater fighters—will want something more manœuvrable than the comic flying trawlers and aerial houseboats on which so many aviators have been taught how not to fly.

The Loening "Flying Yacht" answers well the requirements of the amateur owner. To ensure high performance a 400-h.p. Liberty engine has been combined with a low resistance monoplane wing structure and a quick-lifting hull. It is not permissible to give details of the wing structure, as this is used on the Loening Model 21 fighting monoplane developed for the U.S. Army Air Service, except to say that the wing has a thick section with a reverse curvature. The wings are braced amid-ships to the engine mounting, which consists of two X structures of steel tubing, and outboard, by means of steel struts, to the hull. The span is 43 ft. and the chord 8 ft. The wings are set at 45 degrees incidence and embody neither dihedral nor sweepback. The entire wing structure weighs complete with the bracing struts only 200 lb.

The engine, as may be seen from the accompanying picture, is mounted high above the wings, where the radiator gets the full benefit of the air speed, and is readily accessible from the cockpit. The propeller is a direct connected 2-bladed Hartzell. A Bior self-starter enables the pilot to start the engine without leaving his seat.

The cockpit seats five people, two in front, and three in the rear. The accommodation is extremely comfortable, and the

occupants are not only well protected against the wind because of the depth of the cockpit, but the noise of the engine is also considerably attenuated, for the thick wings act as a sound-muffler. This is particularly noticeable in the rear seats.

The hull has a three-ply V bottom of 21 degrees which runs all the length of the boat. The bottom is built of two plies of spruce and of a single ply of  $\frac{1}{2}$  in. ash, the latter forming the outer skin. The total thickness of the bottom is  $\frac{3}{4}$  in. The sides are of  $\frac{1}{2}$  in. mahogany veneer. The hull is divided into sixteen water-tight compartments, each of which is fitted with an individual hand-hole.

The most notable point about this hull is that it forms a sealed pontoon upon which the cockpit and the engine-bed are built up in the form of superstructures. As a result, when taxiing, the occupants are well protected against the spray, while the hull can be built much lighter for the same volume than were it to contain the cockpit, for this would take so much away from the general buoyancy.

The tail structure consists of two vertical fins which are secured at the outer corners of the pontoon, and serve as supports for the tail-plane and the elevator. Two rudders are hinged to the fins. None of the control surfaces are balanced. Two small skid fins are mounted on the tail plane.

The behaviour of the machine in the air as well as on the water is extremely pleasing. The machine taxis very smoothly, and the take-off occurs without any porpoising. The same remarks apply to the alighting, the amount of spray created thereby being unusually small and directed well abaft. In the air the machine handles unlike any flying-boat your correspondent has yet had the opportunity of observing aloft. Its movements are what the French call *nerveux*, that is, the boat answers the controls instantly, although it is not over-sensitive, which naturally would not be desirable. Altogether it is a very remarkable machine.

On Aug 16th, the Loening Model 23 was taken up by Dave McCulloch, Commander, U.S. Naval Reserve Forces, with three additional passengers, to a height of approximately 19,500 ft., which constitutes a new American—and probably a world's—record for seaplanes carrying four people. As this was only the machine's second flight since it left the shops the gratification of its constructors may well be imagined, for the boat seemed from the first to be perfectly balanced, aerodynamically and hydrostatically.

## SPECIFICATION OF THE LOENING MODEL 23.

Span .....	43 ft.	Maximum speed .....	125 m.p.h.
Overall length .....	29 ft. 3 in.	Cruising speed .....	110 m.p.h.
Maximum height .....	8 ft.	Climb .....	9,500 ft. in 10 min.
Chord .....	8 ft.	Fuel capacity, .....	2½ hr.
Incidence .....	4½ deg.	Wing loading .....	
Wing area (total) .....	338 sq. ft.		
Engine, .....	400-h.p. Liberty	Power loading, .....	18.7 lb. per sq. ft.
Weight (dry) .....	2,200 lb.		
Useful load .....	1,350 lb.	Factor of safety .....	8.9
Weight loaded .....	3,550 lb.		

## GERMAN GLIDERS IN ENGLAND.

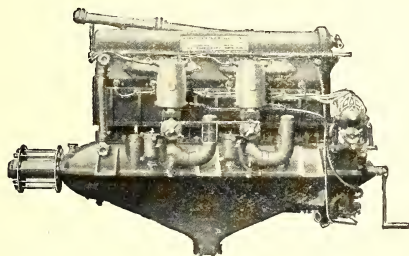
It is stated that the agency for the manufacture and sale of gliders of the type used by Klemperer in the Rhön competitions has been acquired in this country by Mr. J. T. P. Jeyes, of 8, The Crescent, Northampton.

Those who may meditate taking up gliding on a machine of undoubted merit should communicate with him.

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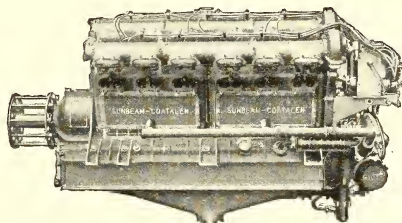
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KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.

### A SUCCESSFUL YEAR.

The Annual General Meeting of D. Napier and Son Ltd. was held on Dec. 22nd, with Mr. H. T. Vane, C.B.E., Joint Managing Director, in the Chair. The report showed a state of affairs which must be envied with a whole heart by the majority of firms in the motor trade for, after making due provision for depreciation and so forth, the profits for the year amounted to £79,008. Furthermore, the bank loan had been reduced from £192,000 to £34,000 during the financial year, and at the time of the General Meeting it had been still further reduced to the purely nominal sum of £100. Also the reserve for income-tax had been raised to £20,000 more than that shown in previous accounts.

Another highly satisfactory feature of the report was that the general reserve had been raised to £154,000, which is more than half the amount standing in the balance sheet for good-will, and Mr. Vane stated that the Directors' policy is to build up this general reserve to a sum equal to the good-will figure, a wholly commendable scheme.

Yet another fact which is very much on the right side is that the valuation of such tangible assets such as freehold land, buildings, plant and so forth, are taken into the balance sheet at cost "less depreciation," whereas one imagines that these assets might well have been taken in at a much higher figure owing to the appreciation of the value of everything since they were acquired by the firm.

Naturally Mr. Vane expressed the Directors' satisfaction at the results achieved by the Napier aero engine. On this point he said:

"We have been fortunate in having another string to our bow in the Napier aero engine. These engines are being used more than any other at present on the London-Paris Air Service, and have given excellent results, not a single serious accident having occurred during the past season on any of the machines fitted with the Napier engine on these daily services. In addition to which I may mention these machines are more economical to run, and carry more passengers and greater loads than machines fitted with other types of engines."

"In the British Air Ministry, the Napier 450-h.p. aero engine is known as the 'Lion,' which, as you know, is the king of the animal world, and it is a fact that the 450-h.p. Napier aero engine is undoubtedly the king of aero engines in production today. We have, however, made further progress with another much more powerful aero engine which is to follow the 'Lion,' and which is known in the British Air Ministry as the 'Cub,' a very healthy youngster, which develops over 1,000 h.p. Of this I do not want to say too much at present, beyond that it is not only regarded here as being a wonderful engine, but we have had aeronautical experts from all parts of the World to see this, and as time goes on important developments should occur in connection with it."

"Some of you will have read articles in the Press recently relating to Britain's aerial defence, and I would only say in connection with this that I cannot but feel that our Government will see the wisdom of providing adequate aerial defence for the British Empire, and not induce in false economy, as would be the case if they did not take steps to increase the efficiency and equipment of our Air Force, and, incidentally, to foster British aircraft both for military and commercial purposes."

Since the last General Meeting Mr. George Pate, who is the Company's chief engineer, has been appointed to the directorate, and another distinct acquisition to the directorate is Sir Harry Brittain, K.B.E., who is Member of Parliament for the division in which the firm's works are situated.

Mr. Vane paid a graceful tribute to the assistance and hearty co-operation which he had received from the directors, the staff and the employees of the firm.

It is of interest to note that Mr. Montague Napier, who for reasons of health is compelled to reside in the South of France, remains Chairman of the directors and is joint managing director with Mr. Vane. Though Mr. Napier never appears in public in connection with the firm one is in a position to state very definitely that he is a very live and powerful influence in the firm's policy. As a matter of fact, he was himself very largely responsible for the actual design of the Napier aero engines, and for the directors' bold policy which permitted the firm to produce the "Lion" engine when there seemed but little prospect of getting orders for it from the Air Ministry and so produced just when it was needed

the engine which has proved itself to be by far the best in its class in the World.

### A REAL AMPHIBIAN.

Yet another triumph for the Fairey Aviation Co. Ltd. has to be recorded. Everybody admits that an amphibian aeroplane is greatly to be desired both for Service and Civil Aviation, but hitherto the chief drawback to the amphibian type has been that a certain amount of time is necessary in which to haul up the landing wheels in order to alight on or get out of the water or to lower them and lock them in position when intending to alight on or get off the land. Jamming of the operating gear with the wheels down would make it impossible to get off water and would make a somersault certain when alighting on water. Jamming of the gear with the wheels up would make it impossible to get off land and would probably ensure a crash when alighting on land.

The great desideratum therefore has been a true amphibian undercarriage combining floats with wheels which have not to be raised and lowered. Before the War several attempts were made with undercarriages of this sort, but either the floats refused to unstick from the water or the machine somersaulted on alighting. Now, however, as the result of long and delicate experiments, Mr. C. R. Fairey has produced a new type of float in which the wheel projects underneath sufficiently to make it possible to alight on or start from any ordinary aerodrome or beach, and yet the wheel is placed in such a way as not to interfere with alighting on or starting from water.

This is undoubtedly the greatest step forward which has yet been made for some years in the production of a satisfactory amphibian aircraft and it opens a way towards the regular use of such machines for air line work. It is to be hoped that the Department of Civil Aviation in particular will not neglect this new development as it has hitherto neglected such essentials to the success of Commercial Aviation as slot and variable-camber wings, adequate wireless communication, and so forth.

### A PRIZE FOR HELICOPTERS.

It is proudly stated that the Air Ministry is seeking the consent of the Treasury to the allocation of a sum of £50,000 as a prize for the best design of helicopter to fulfil certain specified conditions.

The required performance is alleged to be the ability to rise to 2,000 ft. with pilot and one hour's fuel, to be able to remain stationary over a given object for 30 minutes in a 20-mile per hour wind, to be able to maintain a horizontal speed of 60 m.p.h., and to be able to descend vertically with engine off in a 20-m.p.h. wind.

Subject to the Treasury sanction, it is probable that a competition open to the world will be held.

### THE ROYAL AERONAUTICAL SOCIETY.

#### STUDENTS' SECTION.

**Membership.**—Membership is reserved for those under the age of 26 who are receiving a technical training such as will fit them in due course to become Associate Fellows. No entrance fee; subscription one guinea.

**Privileges.**—Students are entitled to attend the Society's lectures, receive the monthly Journal free of charge and borrow books from the Society's Library.

**Monthly Discussion Meetings.**—Meetings are held every month throughout the Winter (as far as possible on the second Thursday of each month) in the Society's Library at 7.0 p.m., with a Member of the Society in the Chair to direct the proceedings but not to intervene in the discussion. Whenever possible the proceedings open with a paper read by a Student for the purpose of inaugurating the discussion. These papers are eligible for the annual award of the "Pilcher Memorial Prize for Students."

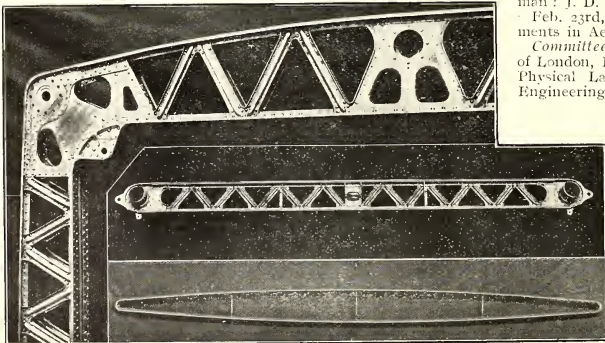
**Forthcoming Lectures.**—Jan. 26th, Colin Daniel on "Some Practical Points in Fuselage Construction." Chairmen: J. D. Frier, M.R.C.Sc., A.F.R.Ae.S.

Feb. 23rd, G. R. Irvine on "Some Possible Improvements in Aero Engine Installation."

**Committee.**—Stanley H. Evans, hon. sec. (University of London, East London College); L. J. Jones (National Physical Laboratory); W. H. Rossiter (Northampton Engineering College).

**FRENCH DURALUMIN WORK.**—The illustration shows some of the details of construction of the Breguet "Levathan" (Breguet-Bugatti four-engine central power plant, 900 h.p.)

The outermost subject is part of one of the main bulkheads of the fuselage. The upper of the two smaller photographs is an intermediate fuselage strut, and the lower one is one of the curious interplane struts. Each of the two longer members is a streamline tube, the two are tied together at intervals by similar sections. The view is a front elevation of a strut.





# ANOTHER TRIBUTE TO THE STERLING QUALITIES OF TITANINE DOPE.

*Extract from letter dated December 1st, 1921, received from H. P. Folland, Esq. (Designer for the Gloucestershire Aircraft Co., Ltd.), in connection with a forced landing of the B.R.2 Scout (Mars III) in the North of France. The Dope referred to is "Titanine":—*

"The usual crowd gathered round the machine and one or two put their feet through the fabric. This necessitated repairs over an area of the wings of approximately 6 to 8 sq. feet. As we had no facilities for doping, we had to make the best of a bad job. The new piece of fabric was doped on the wing in a shed, in which the temperature was below freezing. As we had to make a hurried repair, 3 coats of dope were applied in less than ten hours.

**The new portion when dry was as tight as the original dope. The temperature and the putting on of the coats of dope in so short a time did not appear to affect the excellent tightening of the dope, the result was perfectly good and I think it speaks volumes for the quality of your dope."**

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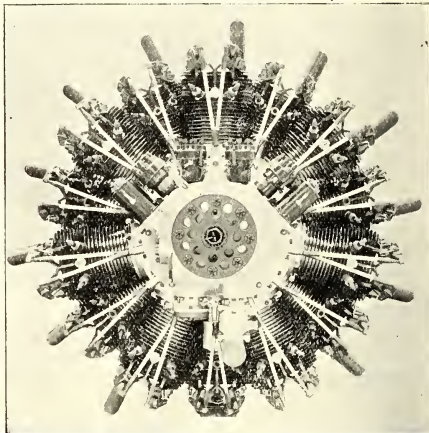
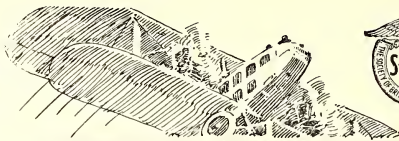
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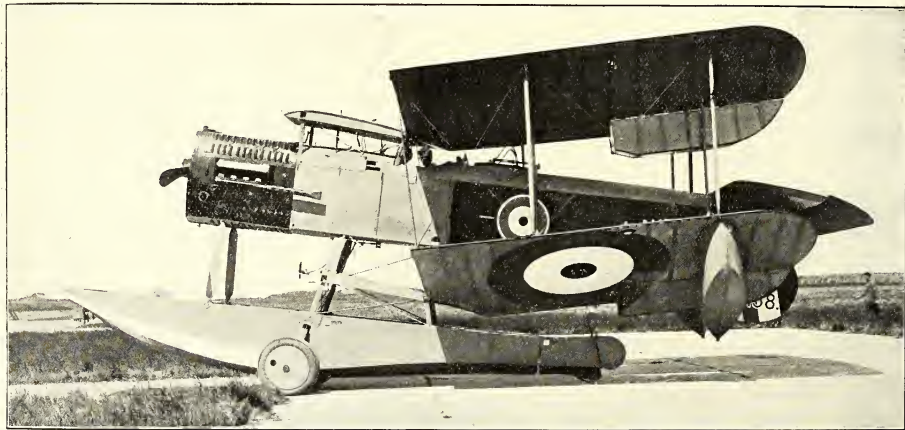
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## R.A.F. INTELLIGENCE.

## R.A.F. Appointments.

It is notified that Air Commander F. C. Hahban, C.M.G., D.S.O., M.W.O., assumed duty as Director of Aeronautical Inspection on Jan. 3rd, 1922.

This post was formerly held by Brig-General R. H. Bagnall-Wild, C.M.G., C.B.E., who recently succeeded Air Commander H. R. M. Brooke-Popham, C.B., C.M.G., D.S.O., A.F.C., as Director of Research, and the appointment of the latter as Commandant of the R.A.F. Staff College, on formation.

Wing/Cmdr. C. E. C. Stanford, D.S.O., M.B., B.Sc., from Headquarters, Inland Area, to Inspectorate of Recruiting (C.A.) as Medical Officer of Recruiting. 10/12.

Wing/Cmdr. M. G. Christie, C.M.G., D.S.O., M.C., from Air Ministry (Controller-General of Civil Aviation) to R.A.F. Depot (I.A.) (Superannuation). 1/1.

Wing/Cmdr. A. V. Bettington, C.M.G., from H.Q. No. 11 (Irish) Wing to School of Military Administration Attached for Senior Officers' course of instruction. 13/1.

Wing/Cmdr. H. R. Nicholl, O.B.E., from H.Q., I.A., to School of Military Administration. Attached for Senior Officers' course of instruction. 13/1.

Wing/Cmdr. H. S. Turner, M.B.E., D.T.M., from H.Q. No. 1 School of T.T. (Boys) (Haltion) to School of Military Administration. Attached for Senior Officers' course of instruction. 13/1.

S/Ldr. W. R. Keel, N.C., D.F.C., A.F.C., from No. 216 Sqdn. (M.E.A.) to R.A.F. Depot (I.A.). 28/11.

S/Ldr. N. C. Spratt, from School of Naval Co-operation and Aerial Navigation (C.A.) to Air Ministry (Directorate of Research). 12/1.

S/Ldr. A. B. Gaskell, D.S.C., from H.Q., C.A., to No. 29 Grp. H.Q. (C.A.). 25/1.

F/Lt. J. K. Summers, M.C., from No. 2 F.T.S. (I.A.) to No. 5 F.T.S. (I.A.). 1/1.

F/Lt. A. Lees, from R.A.F. Depot (I.A.) to Aeroplane Experimental Establishment (I.A.). 9/1.

F/Lt. G. E. Gouville, from Air Pilotage School (Cadre) (I.A.) to Admiralty Com. Observatory. 23/1.

F/Lt. J. W. Woodhouse, D.S.O., M.C., from Inter-Allied Aeronautical Commission of Control (Hungary) to R. A. F. Depot (I.A.). Superannuation. 20/12.

F/Lt. C. H. Keith, from School of Naval Co-operation and Aerial Navigation (C.A.) to No. 230 Sqdn. (C.A.). 2/1.

F/Lt. I. T. Lloyd, from School of Naval Co-operation and Aerial Navigation (C.A.) to No. 2 F.T.S. (I.A.). 2/1.

F/Lt. H. E. P. Wigglesworth, D.S.C., from Air Ministry (D. of E.) to R.A.F. Depot (I.A.). (Superannuation). 20/1.

F/Lt. B. C. Adamson, from I.A.A.D. to R.A.F. Cadet College (Flying Wing) (Cranwell). 9/1.

F/Lt. J. V. Read, M.B.E. The recent notification wherein this officer was posted from I.A.A.D. to R.A.F. Cadet College (Flying Wing) is hereby cancelled.

P/O. G. A. F. Bucknall to No. 5 F.T.S. (I.A.) on appointment to Permanent Commission. 10/12.

The following Pilot Officers to No. 5 F.T.S. (I.A.) (on appointment to Short Service Commissions on probation)—H. J. Wykes, A. K. Crowther, C. P. H. Grace, J. S. Phillips, E. Marlor. 20/12.

The following Pilot Officers to No. 2 F.T.S. (I.A.) (on appointment to Short Service Commissions on probation)—R. L. Palmer, W. A. C. A. Yearsley. 20/12.

## The R.A.F. Cadet College.

The following is a list of Cadets, in order of merit, who passed out of the R.A.F. (Cadet) College in the December examinations:—

Mills, G. H. (Awarded Fellowes Memorial Prize), Barratt, J. B., Waite, R. N., Akerman, W. J. M., Revington, A. P., Hayter-Hames, N. C. (Awarded R.M. Groves Memorial Prize), Mackay, M. B., Whelan, R. D., Shepherd, G. C. (Subject to completion of flying training), Mangles, R. A. R., Brown, J. R., Spaight, R. H. B. (Subject to completion of flying training), Barnard-Smith, G. B., Rowe, F. C. T., Bonham-Carter, D. W. F., Mitchell, F. G. S., Brook, W. A. D., Gore, C. W., Stone, R. A. B., Falconer, C. L. (Awarded Sword of Honour), Coombe, G., Desmond, D. J., Gay, G. W., Lacey, E. V. S., Springfield, C. M. O. O., Stone, C. J., Pontifex, R. W., Garnon Williams, M. H., Hawtrey, J. G.

## The Camberley Staff College.

The following officers of the R.A.F. have been nominated for admission to the Staff College, Camberley, for one year:—

Grp/Capt. A. M. Longmore, D.S.O., S/Ldr. L. A. Pattinson, D.S.O., M.C., D.F.C.

## Martlesham Dinner.

The second annual reunion dinner of the Martlesham Heath Experimental Station will be held on Friday, Jan. 20th, at the Café Royal, Regent Street, W.1, at 7.0 p.m. Brig-Gen. R. K. Bagnall-Wild, C.M.G., C.B.E. (Director of Research), will be in the chair. Tickets (75s. 6d.) can be obtained from Capt. P. G. Robinson, Room A.139, The Air Ministry, W.C.2.

## 100 Squadron Dinner.

Some thirty officers, N.C.Os. and men of 100 Squadron, R.A.F., gathered at the Holborn Restaurant on Saturday, Jan. 7th, for the Annual Dinner, a very good turn-out considering the present hard times. S/Ldr. Burge occupied the Chair in the absence of Wing/Cmdr. Christie, who was away on leave in view of pending service overseas. The Chairman was supported (metaphorically) by S/Ldrs. John Sowrey and McLoughrey. A thoroughly joyous evening was spent with song and conversation.

A notable event was the presence of two officers of the existing 100 Squadron now serving in Ireland, one of whom had also served in 100 during the War. This is, one believes, the first time a serving officer of an existing squadron has been present at a squadron reunion. Another score for 100.

S/Ldr. Burge, proposing the Squadron, referred to the possibility in future of having all squadron reunions on the same night so that there might be a general gathering of the

past and present R.A.F., each squadron, however, retaining its own individuality and making its own organisation. A new Committee comprising most of the former committee-men was elected to arrange future reunions. Altogether it was one of the cheeriest and most successful of such functions.

## R.A.F. SPORTS AND PASTIMES.

## The R.A.F. Memorial Fund Football Week.

Through the generosity of Mr. Alexander Duckham the R.A.F. Memorial Fund has recently come into the possession of a large house and grounds known as Vanbrugh Castle, near Blackheath, and in August last a home for sons of deceased airmen was opened there. The boys are educated, fed and clothed entirely by the Fund at a cost of about £2,000 per annum.

No assist in this and the several other objects of the Fund the R.A.F. Football Association have inaugurated an "R.A.F. Memorial Fund Football Week" lasting from Jan. 21st to 28th. All gate receipts go to the Fund, and collections are made on the ground. The proposal has been received with enthusiasm and it is hoped to raise a not inconsiderable sum.

The Memorial Fund Committee require £400,000 to enable them to carry out their original schemes. At present a little over one-third has been raised.

## The R.A.F. Rugby Team.

The R.A.F. v. Northampton.—The R.A.F. beat Northampton at Northampton on Jan. 7th by 1 goal, 1 dropped goal and 1 try (12 points) to nil.

Northampton started well and the R.A.F. were twice forced to touch down. A sustained attack by the R.A.F. was followed by a dropped goal by F/O. J. I. T. Jones. The R.A.F. play steadily improved and following a forward rush F/Lt. Turner scored a try which was not converted.

In the second half Northampton made a strong attack but were well held by the Air Force defence. Late in the game the R.A.F. forwards got through again, F/Lt. Usher scoring a try which was converted by F/Lt. Maxwell.

The R.A.F. team was as follows:—Full back, F/O. H. H. Storrs. Three-quarters, F/O. J. K. Smith, F/O. W. Jones, F/Lt. O. C. Bryson, Cdt. Falconer. Halves, F/O. J. I. T. Jones, F/Lt. H. M. K. Brown, F/Lt. G. H. Maxwell, F/Lt. R. C. Usher, S/Ldr. W. C. Hicks, F/Lt. E. F. Turner, F/Lt. L. Whitworth, F/O. T. L. Lowe, F/O. J. Drabble, and Sjt. Smith.

## R.A.F. Hockey.

The results of the first round of the R.A.F. Inter-Unit Hockey Competition are as follows:—

No. 1 District.—Gosport 4, Calshot 3; Winchester 7, Upavon 0; Netheravon 11, Andover 0; Lee-on-Solent a bye.

No. 2 District.—Martlesham w.o. Bircham Newton scr.; Leuchars w.o. Spittlegate scr.; Cranwell w.o. Shotwick scr.

No. 3 District.—Haltion (B.) 2, Manston 0; Uxbridge (H.Q.) 1, Grain 2; Penlow 3, Ruislip 1.

The following is the draw for the second round which is to be played off by 23/1/22:—

No. 1 District.—Gosport v. Winchester; Netheravon v. Lee.

No. 2 District.—Leuchars v. Martlesham; Cranwell a bye.

No. 3 District.—Henlow v. Hailton (B.); Grain a bye.

## Henlow Notes.

SOCCER.—I.A.A.D. played no matches over Christmas and the New Year. Serious operations re-opened on Jan. 9th, when our "A" team met the First Division Bedford League leaders, Sandy Town, on their ground. The Sandy team had hitherto enjoyed an unbeaten record, but on Saturday our men proved their superiority by 7 goals to 2. This places us second on the League table with two matches in hand, and we should have no difficulty in securing top honours.

Reverting to Saturday's match, the score at half time was 2 all. After that our opponents were never in the picture, and our side ran them off their legs. F/Sjt. Thomson (1) and Acs. Weaver, Bowditch (who was moved up from the half-back line) and Izard, were our goal scorers.

On the same I.A.A.D. "B" team put Shefford out of the Bedford Junior Cup Competition, 2—0.

GENERAL.—On the 5th a farewell dinner was given at the Officers' Mess to F/Lt. B. C. Adamson, who has served on the station since November, 1918, and who had been posted to Cranwell. F/Lt. W. H. T. Baldwin, R.A.F.M.S., has gone to Uxbridge after 9 months' duty here as Medical Officer. He has been replaced by F/Lt. G. H. H. Maxwell, who is receiving a Depot Rugby trial on Wednesday in a match against Duxford, with a view to inclusion in a game against Olney the Saturday following.

## Uxbridge.

RUGGER.—The Old Alceynians beat the Depot on Jan. 7th by 12 points to nil.

SOCCER.—On Jan. 7th Hanwell beat the Depot by 1 goal to nil, and Hanwell Reserves beat Uxbridge Reserves by 3 goals to 2.

HOCKEY.—On Jan. 7th the City of London beat the R.A.F. Depot by 4 goals to 2. Playing at Uxbridge on Dec. 31st, the Gt. Western Rly. beat the Depot by 6 goals to nil.





# COMMERCIAL AERONAUTICS

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THE UNITED KINGDOM OF GREAT BRITAIN AND IRELAND.

## CONTINENTAL ARRIVALS AND DEPARTURES.

[The following table of arrivals at and departures from the British Air Ports is compiled on the following system:—First comes the initials of the Air Line; next the type of machine; next the international number of the machine; next the ports of departure and destination; next the time of departure and arrival; next the cargo, whether goods (G) and/or mails (M); next the number of passengers; and finally the name of the pilot and number of mechanics, if any.]

ABBREVIATIONS:—A.D.—Aircraft Disposal Co. B.A.—Berkshire Aviation Co. B.C.—Bristol Aeroplane Co. B.M.—Brompton Motor Co. C.A.—Department of Civil Aviation. D.H.—De Havilland Aircraft Co. G.E.—Compagnie des Grands Express Aériens. H.P.—Handley Page Transport Ltd. I.L.—Instone Air Line. K.L.—Koninklijke Luchtvaart Maatschappij. L.A.—Leatherhead Aviation Services. M.A.—Messageries Aériennes. M.W.—Marconi Wireless Telegraph Co. Ltd. P.O.—Privately owned. P.L.—Pettit Ltd. S.F.—Surrey Flying Services. S.N.—Syndicat National pour l'Etude des Transports Aériens (S.N.E.T.A.).

The London Terminal Aerodrome, Croydon. (Telephone: Croydon 2720.)

### JANUARY 2nd:

NIL.

### JANUARY 3rd:

I.L.P., H.P., G-EATN, London-Paris, 12.13-14.25, G., 2, Olley & 1. M.A., Breguet, F-ADAV, London-Paris, 12.15-14.05, G., Nil, Robyn. I.L., D.H.8, G-EAWO, London-Paris, 12.35-14.30, G.M., 4, Holmes & 1. H.P., H.P., G-EATH, Paris-London, 11.09-10.12, G., 1, Rogers & 1. I.L., Vimy, G-EASI, Paris-London, 11.49-12.10/4th, G., 19, Courtney & 1. M.A., Spad, F-ACMF, Paris-London, 12.45-16.15/4th, G.M., Nil, Portal.

### JANUARY 4th:

NIL.

### JANUARY 5th:

M.A., Spad, F-ACMF, London-Paris, 12.05-14.04, G., Nil, Portal. I.L., Vimy, G-EASI, London-Paris, 12.22-14.30, G.M., Nil, Courtney & 1.

### JANUARY 6th:

I.L.P., D.H.4, G-EAWH, London-Paris, 12.28-14.25, G.M., Nil, Wilcockson. H.P., H.P., G-EATN, Paris-London, 11.07-14.53, G., 4, Olley & 1. G.E., Goliath, F-ADDT, Paris-London, 11.45-15.05/8th, G., 1, Gastoux & 1. I.L., Vimy, G-EASI, Paris-London, 12.05-13.20/8th, G., 2, Courtney & 1. M.A., Breguet, F-CMAR, Paris-London, 12.50-13.35/8th, G.M., Nil, Delage.

### JANUARY 7th:

H.P., D.H.4, G-EAWH, Paris-London, 11.00-13.32/8th, G., 2, Wilcockson. M.A., Spad, F-ACMF, Paris-London, 12.57—air. Lympe, G.M., Nil Paille.

### JANUARY 8th:

NIL.

## Inland Flying at Croydon.

Jan. 2nd—NIL.  
Jan. 3rd—H.P., test H.P. (Wilcockson & 1); W.8 to Cricklewood (Wilcockson & 1).  
Jan. 4th—I.L., D.H.4 Brooklands return (Barnard).  
Jan. 5th, 6th, 7th—NIL.  
Jan. 8th—P.O. Bristol to Stag Lane (Bailer).

## Cross-Channel Statistics.

Week ending January 8th:—  
Machines, 15; Passengers, 36; Crews, 23; Total Personnel, 59.  
Corresponding week last year:—  
Machines, 24; Passengers, 15; Crews, 25; Total Personnel, 49.

## The London Terminal Aerodrome.

The past week has not been a very good one for the air lines, though there have been days in which they washed out for high winds, a thing unheard of in the days of the old air lines. But now we have Commercial aviation.

One stated last week that the Instone Air Line might use D.H.32s during the coming season. This, however, now seems unlikely. It is understood that when the Instone Air Line was recently formed into a private limited company, as such, Vickers Ltd. became partly interested in the concern, and under those conditions it would seem natural that the Instone Line in future should use only Vickers machines. It is believed that the Compagnie des Grands Express Aériens and the Messageries Aériennes are also somehow or other interested.

The Vickers machines to be used will be the new eight-seater with the 300-h.p. "Eagle" Rolls-Royce, and the big twin Napier machine, which is the commercial model of the Vickers troop-carrier, of which a number are being built for the R.A.F. in Mesopotamia. (See also Brooklands notes.)

On Saturday Mr. Shaw was to take the Instone D.H.4 on a special trip to Paris and Mr. Barnard was going to take the D.H.18. The I.A.L. decided however that the weather was too bad.

Handley Page Transport have had a better week, and have been getting the most out of their two remaining O/400s. The W.8 went back to Cricklewood, for further experiments, piloted by Mr. Rogers. This machine has afforded valuable information towards the designing of the Handley Page machine to be used in the coming year.

Further experiments have been made with the "Eagle" Rolls-Royce which is being run by Handley Page Transport for various readings, though the noise of it has not been quite so offensive as before Christmas.

Mr. Muir was testing an all-white D.H.9 for Switzerland.

He was up in the gale on Wednesday, and had the misfortune to break a wheel when landing.

The same day, which was the day the air lines washed out, Mr. Courtney came in from Lympe, where he had landed over night on the Instone "Vimy." He got bumped about badly as he came in.

The fence round the aerodrome is now complete and turnstiles and gates are being put up in readiness for the Aerial Derby and other race meetings which the Royal Aero Club intend to hold at Croydon this year.

It will come as a considerable surprise to the readers of THE AEROPLANE to learn that the Staff are ordinary human beings and mortals subject to "the heartache and the thousand natural ills that flesh is heir to." (The terminal proposition is Shakespeare's.) Personally one collided with a thoroughly unsubsidised influenza germ. Hence the brevity of these notes. And so to bed.—G. D.

## Brooklands.

The Vickers works are busier than ever, and an increase in contracts for various machines has necessitated night shifts being worked in several departments. Skilled carpenters are urgently needed, but owing to Trade Union difficulties they are not at present easy to obtain.

The other day the "Viking IV" for the United States Naval Air Service was tested at Brooklands, both by Capt. Cockerell and by Commander White (U.S.A.), while Sir Keith Smith also made a "Rip" in it. This machine has a new high lift wing section, with the result that its climb is increased, while the landing speed has been greatly reduced. The top speed is lowered by a few miles per hour. The machine was also given water tests on the Thames, and altogether has given very great satisfaction, both to the constructors and the purchasers.

A number of similar machines have been ordered by the Japanese Government.

# INSTONE AIR LINE

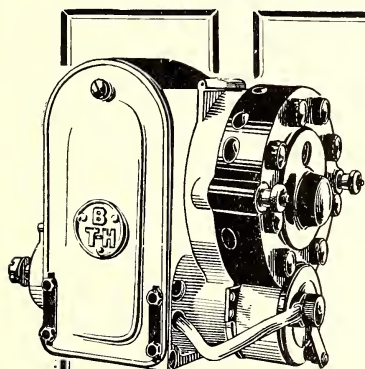
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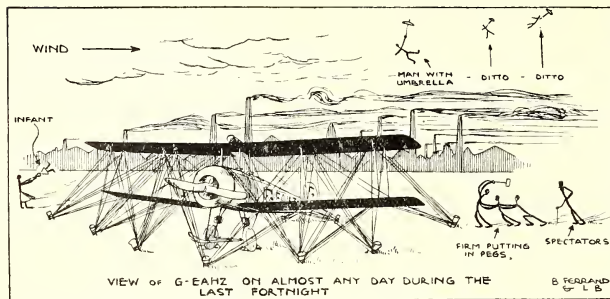
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CIVIL AVIATION 1921-22.—An eloquent communication from the Berkshire Aviation Tours.

Incidentally, Mr. James finds that the landing speed has hardly increased with the reduced surface.

Anyhow the Gloucestershire Aircraft Co. Ltd. are to be congratulated on the enterprise they have shown with the machine, and one does not doubt that it will not be long before they and Mr. H. B. Folland, the "Bamel's" designer, reap their just rewards.

### To Old Students of the Crystal Palace Engineering School.

Many readers of this paper, specially people who have been technical officers in the R.A.F. or were employed in aircraft construction during the War, have been at one time or another students at the Crystal Palace Engineering School. The Committee of the Crystal Palace Old Students' Society is now organising its annual dinner, and Mr. C. L. Brock (late R.F.C.), the secretary of the dinner sub-committee, is particularly anxious to get in touch with any old students who have been or who are connected with aviation. If therefore any such who see this note will be so good as to send their names and addresses to C. G. G., c/o THE AEROPLANE, 175, Piccadilly, W.1, they will be duly put in touch with Mr. Brock.

### PERSONAL NOTICES.

#### ENGAGEMENT

KILBURN-TOPPIN.—The engagement is announced of Anthony Conning Kilburn, late R.A.F., of Murrah Hall, Troutbeck, Cumberland, youngest son of Mr. and Mrs. C. Conning Kilburn, of Broadstone, Dorset, formerly of Calcutta, and Maud, eldest daughter of Mr. and Mrs. C. Toppin, of the College, Malvern.

#### BIRTHS

TRIVERS.—On Nov. 7th, to Hemia, wife of Maj H. G. Trivers, D.S.C., R.A.F., late 203 and 211 Squadrons, and of Collingwood and 10th Avenue West, Vancouver, B.C.—a daughter.  
WHISTLER.—On Dec. 21st, at Harston, Cambs., to Helene, wife of F/Lt. H. A. Whistler, D.S.O., D.F.C., R.A.F.—a son.

#### UNEMPLOYMENT.

Wanted, a pilot for Avros. Interest given in takings.—Chapman, Leatherhead Aviation Services, Leatherhead.

By the time these notes appear the works should have received confirmation of the order of the Instone Air Line for several of the new single-engined machines, the first of which has also given good results on test. One is informed that some of the machines will be constructed for passenger carrying, and the remainder for goods carrying.

The large twin-engined 23-seater also will be put into production. This machine is almost an enlarged edition of the "Vimy," but one may not divulge details that are probably well known in a good many quarters, even if the Air Ministry does not wish to believe it.

The works have orders for "Vimy" ambulances, "Vikings," "Vimy" commercials, troop-carriers, etc., but for official and other reasons one is not in a position at present to make these statements less vague. Sir Ross Smith is greatly interested in a certain machine now being prepared.

Mr. Pierson talks of a new bomber which may be out in a month or two, and there are other very interesting designs projected.—J. F. S.

### A FAIREY TRIUMPH.

A very remarkable performance was put up last week by a Fairey seaplane with a Rolls-Royce "Eagle" engine which has been specially constructed by the Fairey Aviation Co. Ltd. for weight-carrying and long-distance work. The machine is in fact a modification of the well-known type 3.D. Fairey float seaplane. The span has however been increased to 60 feet and the pilot and passenger arc side by side.

A condition of the tests was that the machine must get off the water in a wind of not more than 10 knots. During a brief calm in the early morning Lt.-Col. Vincent Nicholl, D.S.O., carried out the required performance, getting the machine off in a draught of considerably less than 10 knots when carrying a total load of 7,300 lb., which is equal to approximately 20 lb. per horsepower. Of this total load 3,100 lb. was "useful load" in the form of petrol, crew, etc. This suggests that a similar machine fitted with wheels instead of floats would carry with comparative ease of useful load of 10 lb. per h.p., a figure which one believes has never hitherto been approached. This should provide, if any proof be necessary, convincing evidence of the efficacy of the Fairey Variable Camber Wing.

The air-worthiness of the machine was demonstrated in a very ugly squall which blew up shortly after Col. Nicholl had left the water. Despite the big span of the machine Col. Nicholl took her through gusty wind and heavy rain and, as is his custom, made a perfect landing afterwards. In spite of the very low power for such a load the machine showed a top speed of 86 knots, a cruising speed of 71 knots, and a landing speed under proper control of 42 knots.

From a purely commercial point of view the interesting feature of this performance is that the useful load carried by this Fairey machine is about equivalent to carrying 15 passengers from London to Paris at about 90 miles an hour with an ordinary 360-h.p. Rolls-Royce "Eagle" engine. And yet we continue to build so-called commercial aeroplanes with fixed wing-sections produced years ago during the War, and wonder why Commercial Aviation does not pay.—C. G. G.

### THE "BAMEL"

One ran into Mr. J. H. James on Friday on his way back from Martlesham where he will attempt this week to better his own times over the flying kilometre.

When he has finished this he will take the machine to Lympne where he will attack the 100 and 200 kilometre record. He has a course marked out along the straight piece of railway between Ashford and Penshurst with electrical timing.

It is understood that the Air Ministry are taking an interest in a modified "Bamel" for use as a fighting scout. The machine in its present form has a ceiling of 23,000 feet, and when flying throttled down the machine always has a tendency to climb steeply.

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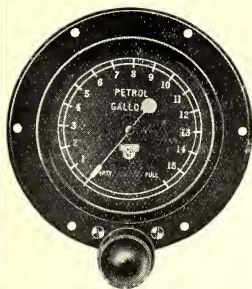
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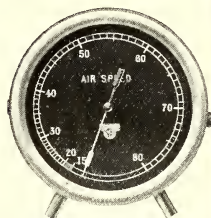
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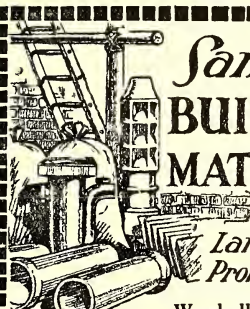
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## INDEX TO ADVERTISERS

Acclies & Pollock, Ltd. ... ..	39	De Havilland Aircraft Co., Ltd., The... ..	37	Sankey, J. H., & Son, Ltd. ... ..	39
Armstrong Siddeley Motors, Ltd. ... ..	34	Fairey Aviation Co., Ltd., The ... ..	23	Short Bros., Ltd. ... ..	Inside Back Cover
Bristol Aeroplane Co., Ltd. ... ..	26	Falcon Aircraft Co. ... ..	Front Cover	S. Smith & Sons (M.A.), Ltd. ... ..	25 & 39
British Thomson-Houston Co., The ... ..	37	Instone Air Line ... ..	36	Sunbeam Motor Car Co., Ltd. ... ..	31
Calthrop's Aerial Patents, Ltd., ... ..	38	London Die Casting Foundry Co., Ltd. ... ..	40	Supermarine Aviation Works, Ltd., The ... ..	Inside Back Cover
Cellon, Ltd. ... ..	39	Napier, D., & Son, Ltd. ... ..	29	Tait-Cox and James ... ..	40
Compendium Publishing Co. ... ..	40	Parnall, G., & Co. ... ..	34	Titanium, Ltd. ... ..	Front Cover & 33
Cunard Line ... ..	40	Roe, A. V., & Co., Ltd. ... ..	Inside Front Cover	Westland Aircraft Works... ..	Back Cover

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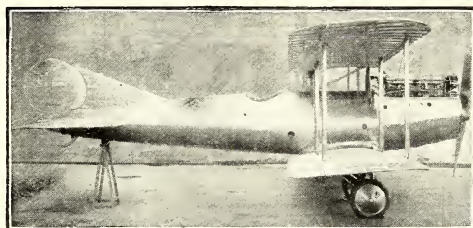
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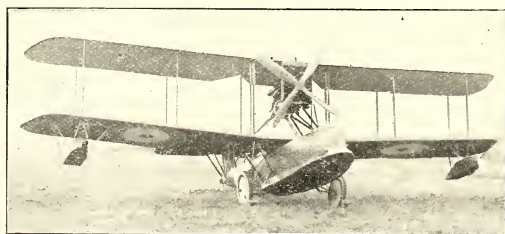
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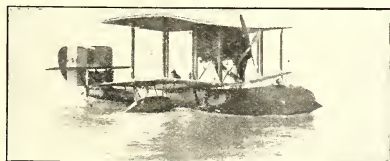
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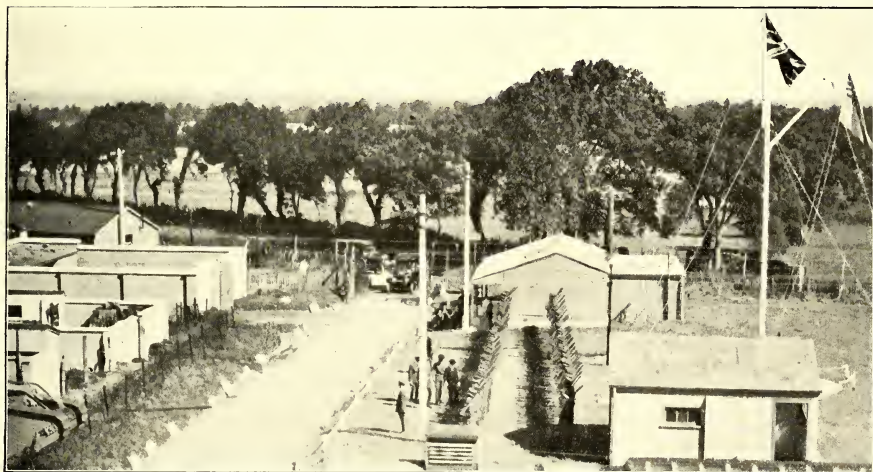
Edited by  
C. G. G. G.

Vol. XXII. No. 3.

SIXPENCE WEEKLY.

[Registered at the G.P.O.  
as a Newspaper.]

## A VICE-REGAL INSPECTION.



AT H.Q., NO. 11 (IRISH) WING, R.A.F.—Lord Fitzalan, Viceroy of Ireland, inspecting the R.A.F. Guard of Honour at Baldonnell just before the coming into being of the Irish Free State.

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## THE REVIEW OF THE YEAR.

[The second half of the Review of 1921 should have been published last week. Unfortunately it had to be held over till this week because of the fortunate sally by the Admiralty into the troubled sea of politico-service intrigue. Therefore one commends another instantly to the kind attention of readers without further preamble.—C. G. G.]

### JULY.

**SERVICE AERONAUTICS.**—The second R.A.F. Pageant took place at Hendon on July 2nd. The exhibition of flying was even more astonishing than it had been in the previous year and the crowd was even greater, but much better managed. As the result of this Pageant over £8,000 was handed to the Royal Air Force Memorial Fund.

On July 9th Air Vice-Marshal Sir Geoffrey Salmond, Air Officer Commanding Middle East Area, flew from Cairo to Baghdad in 12 hours.

On July 14th No. 7 Group R.A.F. held a small Pageant of its own at Andover, when the flying was of the same high quality as that shown at Hendon by the pilots picked from the whole of the R.A.F. As it was a social function in the nature of an At Home given by the Officers and men of the Group Headquarters there was no gate from which the R.A.F. funds could profit.

On July 27th Group Capt. E. R. Ludlow-Hewitt, C.M.G., D.S.O., M.C., was appointed Air Aide-de-Camp to the King.

**CIVIL AVIATION.**—The trials of the D.H.29 cantilever monoplane took place on July 5th.

On July 6th this paper published the scheme put forward by Mr. A. H. Ashbolt, Agent-General for Tasmania, for an Imperial Airship Company with a capital of £1,500,000, half of which was to be issued at once. The company was to operate an airship line between Egypt and Australia.

At the end of the year the scheme was still being discussed. Also on July 6th this paper published an illustrated description of the new Bristol ten-seater passenger machine, Napier engine.

It was notified on July 6th that the Royal Aero Club had acquired four Avros and a B.E.2c, which it had stationed at Croydon in the charge of Capt. Muir for the use of members desiring to fly. Members have the privilege of hiring these machines at £1 per hour, which is vastly cheaper than aircraft can be hired elsewhere.

On July 16th the annual Aerial Derby and its accompanying Handicap was flown at Hendon. The winner was the Gloucestershire Aviation Company's "Mars I," commonly known as the "Bamel" (Napier engine), piloted by Mr. Herbert James. The second machine was a Bristol "Bullet" ("Jupiter" engine) piloted by Mr. Uwins.

The "Bamel" also won the Handicap, from virtual scratch.

The Aerial Derby was preceded by the first organised air race between members of the Universities of Oxford and Cambridge, each University supplying a team of three pilots. The machines were S.E.5s lent to the Universities by the Royal Aero Club, which defrayed all expenses of the race. The machines were hired from the Aircraft Disposal Company and tuned up voluntarily by officials of the Aeronautical Inspection Department, Air Ministry. One machine suffered from engine failure, but all machines behaved admirably and the five who finished were all within a few seconds of one another. Cambridge pilots finished first, second and third.

The works of the famous Titanide dye firm at Hendon were burnt down on July 18th. With customary energy the firm got to work immediately in temporary premises and were able to continue supplies.

On July 19th the Air Ministry appointed an Airship Committee to investigate the scheme put forward by Mr. Ashbolt and the possibilities of running Imperial airship lines.

On July 24th ended what appears to have been the best week of the year for the cross-Channel air lines. The total number for the week was 430 passengers.

**OVERSEAS DOMINIONS.**—It was noted on July 13th that particularly good work had been done in Australia by Avros with Sunbeam "Dyak" engines. Mr. Hogarth, who produced one of these machines, flew home from Sydney, 1,845 miles, to North Queensland. His flying time was 20 hours.

On July 20th THE AEROPLANE published some interesting information concerning photographic survey work in Canada. **AUGUST.**

**SERVICE AERONAUTICS.**—On Aug. 3rd No. 25 Squadron R.A.F. stationed at Hawkinge held a minor Aerial Pageant, at which it was shown that an ordinary service squadron of the R.A.F. could put up as good a show of flying as specially picked pilots from the whole Air Force. As the result of the Pageant the sum of £417 was paid into the R.A.F. Memorial Fund.

A report of the Committee of Public Accounts issued on Aug. 15th criticised severely the Air Ministry for presenting to the Overseas Dominions surplus war machines and other aeronautical material. The said Committee did not deign to explain how this otherwise useless material could have been put to any better use than that of stirring up in the Overseas Dominions an interest in Imperial aviation.

On Aug. 12th the first document from the Sinn Féin Government of Ireland, offering to discuss terms with the British Government, was sent by air from London to Mr. Lloyd George, then in Paris.

The greatest aerial disaster of the year occurred on Aug. 24th when the airship R.38, which had been sold to the United States Army as Z.R.2, broke in the air while over Hull while doing a test flight. Commander Maxfield, U.S.N., with 15 officers and men of the U.S. Navy, and Air Commodore Maitland, R.A.F., with 27 officers and men of the R.A.F. and Air Ministry, died in the accident.

**CIVIL AVIATION.**—A case of some interest to aviators was tried at the Croydon Police Court on Aug. 18th when Capt. E. D. C. Herne was prosecuted under the new Air Laws for a variety of infractions thereof. This was the first case of any real importance tried under the new Act. Capt. Herne was fined £10 on each of several counts.

On Aug. 15th the G.P.O. announced a new rate of postage for parcels sent via the Post Office by Air Post.

The Air Route Syndicate Ltd. was registered on Aug. 18th, this being a revision of the Anglo-Continental Aviation Syndicate previously registered.

On Aug. 31st the Avro "Antarctic Baby" was described.

Mention was made of the new London-Paris air line to be run by Col. Searle and Maj. Woods-Hampshire, of Daimler Hire Ltd., under the new subsidy scheme.

A précis of the report of the Aeronautical Research Committee was published in this paper on Aug. 31st.

In the same issue the precise bearings of Armstrong-Whitworth Aircraft Ltd. to the Armstrong-Siddeley Co. were disclosed and the Armstrong "Sinaia" and "Siskin" were illustrated.

The Berkshire Aviation Co. Ltd. was registered on Aug. 25th, this being the latest development of the most successful of British joy-ride firms.

**OVERSEAS DOMINIONS.**—It was announced on Aug. 3rd that the Australian Government had purchased the beginnings of an air fleet from the Fairey Aviation Co. Ltd.

In the same issue it was noted that Lieut-Col. J. Stanley Scott had succeeded Col. Redpath as Officer Commanding the Canadian Air Force.

On Aug. 12th Mrs. Hughes, wife of the Australian Premier, launched from the Fairey Works at Hamble, Australian Naval Aircraft No. 1 (officially A.N.A.1), a Fairey biplane with Rolls-Royce engine. This was the first unit of the Australian sea-going air fleet.

On Aug. 17th THE AEROPLANE published an account of the seal-spotting expedition from Newfoundland carried out by aeroplanes by Mr. F. Sidney Cotton.

**FOREIGN AERONAUTICS.**—On Aug. 7th the International Schneider Cup Race for aeroplanes was won by the Italian De Briganti on a Macchi flying boat type M.7 at a speed of 120 m.p.h.

Between Aug. 10th and Aug. 25th some most interesting soaring and gliding competitions took place in the Rhön district of Germany, near Frankfurt. Professor Klemperer made the longest glide, remaining 5 min. 30 sec. in the air. After the competition on Aug. 30th Herr Klemperer remained soaring for 13 minutes.

## SEPTEMBER.

**SERVICE AVIATION.**—On Sept. 7th the Air Ministry announced a competition for aeroplane tanks intended to be fire-proof and crash-proof. £2,000 was offered in prizes. The actual tests began in December.

On Sept. 14th it was announced that the R.A.F. intended to train a certain number of N.C.O. pilots. The announcement caused considerable satisfaction, especially in the "Other Ranks" of the Air Force.

The Howden airship base was closed so far as the R.A.F. was concerned, except for a small care-and-maintenance party, on Sept. 20th. Later it was taken over by the Admiralty, ostensibly for the storing of armament.

On Sept. 28th **THE AEROPLANE** reported that Mesopotamia (known officially as Iraq) was to be taken over by the R.A.F., and that the Army was to be withdrawn. Later this information was confirmed officially.

Mr. T. A. Lewis, M.P., was appointed to be Parliamentary Private Secretary to the Secretary of State for Air *vice* Lieut.-Col. Moore-Brabazon resigned. This appointment was reported in **THE AEROPLANE** on Sept. 28th.

The record journey from Baghdad to London was announced on Sept. 28th when it was reported that an R.A.F. officer (Air Commodore Brooke-Topham) had covered the distance in six days.

**CIVIL AVIATION.**—The new Parnall "Puffin" deck-flying amphibian biplane, Napier engine, was described in **THE AEROPLANE** on Sept. 7th.

The report of the Imperial Communications Committee was published on Sept. 14th.

On Sept. 17th the first Air Race Meeting at Croydon: was held in a gale of wind and thick fog. Despite the weather 5,000 people paid for admission and between 8,000 and 10,000 watched the flying from outside the aerodrome. Mr. F. G. M. Sparks, of the Welsh Aviation Company, won three out of four races and F/Lt. W. H. Longton won the fourth. The team relay race was won by 24 Squadron R.A.F., Kenley, beating the R.A.F. Club and the Royal Aero Club.

**THE AEROPLANE** recorded on Sept. 21st that a number of Vickers "Viking IVs," Napier engines, had been ordered by the French and Dutch Governments. The seventh of these machines for the Dutch Government was delivered in December.

On Sept. 25th it was announced that four air lines in all had been approved by the Air Ministry as qualified for the subsidy in 1922.

On Sept. 24th two members of the Royal Aero Club instituted for the first time in England the sport of sniping toy balloons with shot guns from aeroplanes.

The D.H.32, eight-seater biplane, Rolls-Royce engines, was illustrated and described in **THE AEROPLANE** on Sept. 28th.

All pioneers of aviation will lament the death of Farnall Thurstan, who died in his 45th year at Bournemouth of consumption contracted on active service.

Farnall Thurstan was one of the first business men in this country to be concerned with aviation. He was originally in the tea trade and thus acquired a knowledge of foreign business which was of great value to him and the British Aircraft Industry. He married a niece of the late Sir George White, the great pioneer of electric tramways. When Sir George founded the British and Colonial Aeroplane Co. Ltd., now the Bristol Aeroplane Co. Ltd., and always known familiarly as the Bristol Co., Farnall Thurstan was appointed to the business side of the firm, of which his brother-in-law Mr. (now Sir) Henry White-Smith was secretary.

As soon as foreign countries began to take an interest in Service aviation Thurstan went abroad seeking business. In this he was highly successful, for he organised missions with machines and pilots to Spain, Italy, Russia and elsewhere. In all these countries very satisfactory business resulted which went in due course have developed into considerable trade but for the outbreak of war.

His first act during the War did a service to the nation greater than those for which many men have received titles and decorations. The British Flying Services were practically without engines. Every available aeroplane had gone to France or was on patrol along the coast. Thurstan immediately went to Paris and, despite the fact that the French needed all the engines they could get, with his wonderful knowledge of men and affairs he managed by sheer persuasiveness and tact to lay hands on a quantity of Gnome and Renault engines which enabled the R.N.A.S. to carry on till arrangements could be made for new construction.

Not only did he buy the engines but he had a quantity of them packed at once, personally conveyed them to Le Havre, commandeered French military transport for them to the boat and got them through to London as quickly as a passenger could travel. This good work saved the situation in this country, and though Thurstan never received any reward other

than on Sept. 15th Mr. Alan Cobham on a D.H.9 completed a journey begun on Aug. 24th. Taking with him two passengers and luggage for three persons he covered the following route: London, Paris, Brussels, Amsterdam, Brnien, Hamburg, Copenhagen, Stockholm, Christiania, Copenhagen, Berlin, Warsaw, Prague, Vienna, Klagenfurt, Venice, Brescia, Milan, Nice, Nîmes, Paris, London. The total distance was 4,500 miles and the flying time spread over three weeks was 56 hours. This is certainly the longest air tour on record with passengers.

**OVERSEAS DOMINIONS.**—On Sept. 7th it was announced that the Bermuda and West Atlantic Aviation Company had been granted a subsidy by the Government of the West Indies to run an air line from Nassau in the Bahamas to Miami in Florida. It was hoped that this line would be approved by the British Government and be entitled to draw part of the British subsidy.

It was also announced on Sept. 7th that the Australian Air Force would in future be designated "Royal." The establishment of the R.A.A.F. was laid down at 160 officers and 1,500 other ranks. British rank-titles were to be used and appointments were to take effect as from March 1st, 1921.

**FOREIGN AERONAUTICS.**—On Sept. 7th **THE AEROPLANE** published Mr. Handley Page's description of the German soaring tests. In connection with this it is of interest to note that on Sept. 5th Herr Harth made a soaring flight of 21 minutes. On Sept. 6th Herr Martens on a Proll glider remained in the air for 15 minutes 40 seconds, and on the same date Herr Harth soared for 22 minutes, but finished by crashing himself and his machine.

On Sept. 14th occurred the first of two articles on the sinking of two German warships, the *Frankfurt* and *Ostfriesland*, by the U.S. Army Air Service under General Mitchell.

On Sept. 26th M. Sadi Lecoq, on a Niépourt, attempting speed records, covered a kilometre in 10½ seconds, which equals 330 k.p.h., or 206 m.p.h. Contemporary accounts were vague as to whether this was one single flight or whether it was an average of four (two in each direction) over the measured kilometre. In December, when the "Damel" had beaten this speed by doing a single kilometre at 212 m.p.h., much appeared in the French Press denying that the Niépourt had been beaten.

On Sept. 21st President Harding appointed Col. Mason M. Patrick to succeed Maj.-Gen. Charles T. Menoher as Chief of the Air Service, United States Army.

On Sept. 28th Lieut. J. A. Macredy on a Lepère fighter, 400-h.p. "Liberty" engine, with Moss supercharger, reached an indicated height of 41,200 feet. This was afterwards corrected to 40,800 feet.

(To be continued.)

## FRANCIS FARNALL THURSTAN.

than a sincere letter of thanks from Commodore Murray Sueter, then Director of the Air Department, Admiralty, there are many of the old hands in the R.N.A.S. who remember his action with gratitude.

Thereafter, being too old to become a pilot, Thurstan joined the R.N.A.S. and was sent to Paris to organise the obtaining of aircraft supplies for the Naval Air Service. He was liked and respected by the French Authorities and he was personally friendly with all the people who mattered in Paris, so his department was one of the outstanding successes of the early days of the War, in marked contrast to many others.

In this valuable work he continued till the Air Enquiry of 1926 brought to light the gross scandals in the equipment of the R.F.C. which cost the lives of so many of our aviators. Officers were invited to appear before the Committee and were promised immunity from civil consequences, such as official reprisals. Thurstan, full of zeal for efficiency, and knowing exactly how R.F.C. supplies had been mishandled, so far as obtaining supplies in France was concerned, consented under pressure to give evidence. What his evidence was one does not pretend to know, except that it exposed the inefficiency—if nothing worse—of R.F.C. methods.

Thereafter he was a marked man. Though he was an R.N.A.S. officer the arm of the War Office was long enough to reach him. He was removed from Paris and sent on various missions where his knowledge and his particular talents were wasted and where he was bound to be as uncomfortable as possible.

The knowledge that he was marked preyed on his mind and affected his health. Finally, when he was already a sick man, he was sent to Dunkirk just when things were at their worst and the Germans were bombing the aerodromes day and night so that nobody had any rest. The nervous and physical strain and the exposure to all weather night after night broke up his health altogether. Whether he contracted his fatal disease there, or whether those experiences only developed it one does not know, but at the end of the War he was a wreck. Since then he has been living at one sanatorium after another, first



in the Mendips, then in Switzerland, and later at Bourne-mouth, where he died.

He is entitled to his place on the Nation's Roll of Honour as truly as though he had been killed in battle or had died of wounds, for the mental wounds which he received as the victim of official vindictiveness helped the final victory of the illness which he contracted in the King's Service.

Farnall Thurstan possessed much personal charm. He was a good talker and had a ready wit which won him many friends. At the same time there was a certain caustic quality in his wit which because it raised him above the ordinary

man's mental level prevented him from being commonly popular. He had in fact the type of mind which would have made him a success in diplomatic circles or in politics of the international kind. Personally one always liked Farnall Thurstan and one owes him much for sound information based on his shrewd observation and intimate knowledge of men and affairs. If he had retained his health and strength he would have been of great value to British Aviation in its present state. And even though he has died when there was much left for him to do, both the Flying Services and the British Aircraft Industry owes a debt of gratitude to his memory.—C. G. G.

#### GROUP-CAPTAIN

The Royal Air Force will learn with deep regret of the sudden death of Group Captain A. J. L. Scott, C.B., M.C., A.F.C., Secretary to the Secretary of State for Air. Group Captain Scott died in a nursing home of double pneumonia after a few days' illness.

A worthy tribute to the high qualities of Jack Scott, as he was always called, was paid by the Lord Chancellor, Lord Birkenhead, in the *Times*, on Jan. 17th. Mr. F. E. Smith, as the Lord Chancellor then was, met Jack Scott at Melton where he was Master of the University Draghounds. Later he intended to go to the Bar and become a pupil in Mr. Smith's chambers. At the outbreak of war Jack Scott was an officer in the Sussex Yeomanry.

Jack Scott was one of the notable characters of the R.F.C. and later of the R.A.F. He joined the Flying Corps early in the War and after doing good work in the field which won him a Military Cross he became a Squadron Commander somewhat rapidly. While commanding an instructional unit at home it fell to his lot to act as instructor to Mr. Churchill, and while in that versatile gentleman's company he had rather a bad accident in which he broke both his legs.

Mr. Churchill is one of those good sportsmen, all too rare in these days, who never goes back on a friend and never forgets those who have served him loyally. Consequently when the opportunity offered itself and Mr. Churchill became War Minister and Air Minister Jack Scott was

#### A. J. L. SCOTT.

appointed as his personal Secretary for Air Ministry duties, and when Captain Guest succeeded Mr. Churchill he remained to carry on the Churchill schemes and to act as a link between the old and new chiefs.

It would be difficult to think of anybody better suited to be Secretary to any Air Minister than Jack Scott. What he did not know about flying in general and active service flying in particular would be difficult to discover. Some idea of his all-round knowledge may be gained from his entertaining "History of 60 Squadron."

Personally, he was immensely popular both with his seniors and his juniors. Yet his popularity was not that of the merely amiable man, for beneath his cheery exterior he had a strong will and an active brain, and ambition which would have carried him far had he been spared.

He is a very real loss to the R.A.F. for as an active service pilot with a distinguished career as a fighting man and as a leader of fighting men his sympathies and influence were always on the side of the fighting aviator and the officers and men in the field. Also, everybody who has had to deal with his department of the Air Ministry will miss his tactful methods and his charming manner to all who came in contact with him in the course of his duties. For the future welfare of the R.A.F. one can but hope that his successor in the important and delicate office of Secretary to the Secretary of State for Air may be as good a man as was Jack Scott.—C. G. G.

#### THE REPORT ON R.38.

The Secretary of the Admiralty issued a report on Jan. 10th of the investigation made by the Board of Admiralty into the history of the design of the R.38 and her construction up to Oct. 1919, when the responsibility for the design and construction of airships was transferred to the Air Ministry.

The Controller of the Navy (Rear-Admiral F. L. Field) was president of the investigation, and was assisted by Sir Eustace d'Eyncourt, Director of Naval Construction, and Sir Charles Walker, Deputy-Secretary of the Admiralty.

The report stated that no undue risk was taken and that experience and comparison with German airships made permissible any change from previous practice as regards safety which had been made. No modifications were made in the main structure of R.38 during the period the Admiralty was responsible for its construction. No important alterations were made in the design by the Air Ministry, and certain

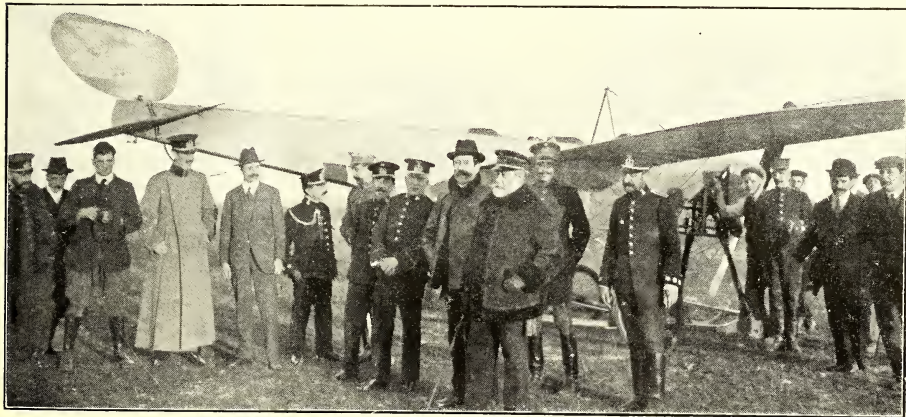
modifications to the fins and cars, etc., which were made for lightness would not affect the strength of the structure.

#### AIR MAIL FUTILITY.

A notice issued by the Postmaster-General on Jan. 10th gives a list of general post offices in towns in the provinces at which parcels can be posted for transmission to Paris by air mail. As the list is of considerable length and as the air mail service to Paris is useless, and in fact causes considerable delay to letters and parcels, it is not proposed to waste the space of *THE AEROPLANE* in publishing the list.

#### GERMANY AND RUSSIA.

The *Times* stated on Jan. 11th that a notice in the German Press states that the Moscow Soviet has approved a draft agreement with a German air line company for a regular service of postal and passenger aeroplanes between Moscow and Berlin via Kovno and Königsberg. It is added that the Lithuanian and Lettish Governments have given their assent to the scheme.



A REMINISCENCE OF EARLY DAYS.—A Bristol Mission in Spain. The late Farnall Thurstan is on the left of the tall officer in the long coat and Wing Cmdr. Harry Busested (without a hat) is on the right of the same officer. The machine is a Bristol Monoplane of the 1912-13 type.



## R.A.F. INTELLIGENCE.

### R.A.F. Appointments.

It is notified that Air/Com. Oliver Swann, C.B., C.B.E., assumed duty as Director of Personnel on Jan. 5th, 1922, in succession to Vice Admiral Sir C. F. Lambert, K.C.B., who recently relinquished this post.

S/Ldr. G. H. Bowman, D.S.O., M.C., D.F.C., from School of Naval Cooperation and Aerial Navigation (C.A.) to R.A.F. Depot (I.A.). (Superannuary.) Attached to C.F.S. for Flying Refresher Course pending embarkation overseas. 16/12.

S/Ldr. G. W. Roberts, M.C., from Air Ministry (Director-General of Supply and Research) to R.A.F. Depot (I.A.). (Superannuary.) 12/1. To join 31/1.

S/Ldr. C. H. Elliott-Smith, A.F.C., from R.A.F. Depot (I.A.) to H.Q. (M.E.A.). 13/1.

S/Ldr. W. B. Hargrave, O.B.E., from C.F.S. (I.A.) to H.Q. (R.A.F. India). 31/12.

F/Lt. A. W. Fletcher, D.F.C., A.F.C., from R.A.F. Base, Leuchars (No. 3 Sqn.) (C.A.), attached to H.M.S. *Argus* for flying duties. 7/1.

F/Lt. L. C. Keeble, from R.A.F. Base, Leuchars (205 Sqn.) (C.A.). Attached to H.M.S. *Argus* for flying duties. 7/1.

F/Lt. H. V. Gernan, from R.A.F. Base, Leuchars (C.A.) to Half-pay List. 27/12.

F/Lt. E. A. Fawcett, from No. 6 Sqn. (M.E.A.) to R.A.F. Depot (I.A.). (Superannuary.) 4/11.

F/Lt. H. O. Long, D.S.O., from R.A.F. Depot (I.A.) to Instrument Design Establishment (I.A.). 5/1.

F/Lt. D. W. Wilson, from R.A.F. Depot (I.A.) to No. 1 S.D. 12/1.

F/Lt. F. G. M. Williams, from R.A.F. Depot (I.A.) to R.A.F. Depot (I.A.). (Superannuary.) 31/12. To join 28/1.

F/Lt. L. H. Slater, O.B.E., D.S.C., D.F.C., from No. 203 Sqn. (C.A.) to Half-pay List. 11/1.

F/Lt. P. J. Wiseman, from Air Pilotage School (Cadre) (I.A.) to C.P.O. (I.A.). 1/1.

F/Lt. W. J. King, D.C.M., from H.Q. R.A.F., Cranwell, to No. 1 S.D. 21/1.

F/Lt. E. S. Baker, from No. 1 S.D. to No. 4 S.D. 17/1.

F/Lt. T. Bell, M.M., from No. 3 S.D. to the Packing Depot. 17/1.

F/Lt. H. S. Scroggs, from No. 4 F.T.S. (M.E.A.) to No. 45 Sqn. (M.E.A.). 6/12.

F/Lt. N. N. Bottomley, A.F.C., from Egyptian Group H.O. (I.A.) to H.Q. (M.E.A.). 7/11.

F/Lt. E. M. Cashmore, from S.D., Egypt (M.E.A.) to H.Q. (M.E.A.). 1/12.

F/Lt. F. T. Allen, from R.A.F. Depot (I.A.) to No. 2 F.T.S. (I.A.) 4/1.

F/Lt. C. M. Ranken, O.B.E., from Air Ministry (Directorate of Operations and Intelligence) to R.A.F. Depot (I.A.). (Superannuary.) 6/1.

S/Ldr. A. A. B. Thomson, M.C., A.F.C., from Inter-Allied Aeronautical Commission of Control (Hungary) to R.A.F. Depot (I.A.) attached to Air Ministry (Directorate of Operations and Intelligence) for temporary duty. 18/12.

F/Lt. T. G. Hetherington, C.B.E., from half-pay list to H.Q. M.E.A. 9/1.

S/Ldr. W. B. Callaway, A.F.C., from R.A.F. Cadet College (Ground Wing) (Cranwell) to School of Naval Cooperation and Aerial Navigation (C.A.). 23/1.

S/Ldr. R. S. Maxwell, M.C., D.F.C., from No. 55 Sqn. (M.E.A.) to R.A.F. Depot (I.A.). (Superannuary.) 4/11.

F/Lt. R. N. Banks-Jones, from No. 1 School of T.T. (Boys) (Halton) to No. 7 Group H.O. (I.A.). 12/1.

F/Lt. A. R. Arnold, D.S.C., D.F.C., from Air Ministry (Directorate of Operations and Intelligence) to R.A.F. Depot (I.A.). (Superannuary.) 19/1.

F/Lt. J. H. W. Fitzgerald, from R.A.F. Depot (I.A.) to C.F.S. (I.A.). 9/1.

F/Lt. C. H. B. Jenner-Parson, from Inspector of Recruiting (Newcastle) (C.A.) to Seaplane Training School (C.A.). 15/1.

F/Lt. E. G. Hopcraft, from R.A.F. Base, Leuchars (205 Sqn.) (C.A.), to Seaplane Training School (C.A.). 15/1.

F/Lt. C. S. Richardson, from No. 4 F.T.S. (M.E.A.) to No. 6 Sqn. (M.E.A.). 10/12.

F/Lt. G. Bowen, from No. 45 Sqn. (M.E.A.), to Iraq Group H.O. (M.E.A.). 10/12.

From the *London Gazette*, Jan. 10th.—R.A.F.—Cpt. J. H. W. Becke, C.M.G., D.S.O., A.F.C., is placed on the retired list and is granted the hon. rank of Brig.-Gen. (Feb. 20th, 1920). (Substituted for the notifications in *Gazettes* of March and 12th, 1920.)

R.A.F.—The following decorations have been conferred by the President of the French Republic in recognition of valuable services rendered during the War:—

Croix de Guerre.—Capt. C. A. Taylor, Lt. R. J. Rodwell.

No. 1. Aeroplane Supply Depot Reunion Dinner

It is proposed to hold a reunion dinner of officers of the late No. 1 Aeroplane Supply Depot (St. Omer, Marquise and Cologne).

The dinner will take place at the Hotel Cecil on Saturday, Jan. 28th, at 7 p.m.

All those interested are asked to communicate with Capt. J. F. Bargman at Ingfield, Osborne Road, South Farnborough.

### The R.A.F. Rugby Team.

The R.A.F. v. Guy's Hospital.—Playing at Honor Oak Park on Jan. 11th the R.A.F. lost a hard-fought game against Guy's by 1 goal (5 points) to 2 tries (6 points).

Facing the sun and wind in the first half the R.A.F. forwards by good work in the loose and quick breaking up from scrums kept Guy's from scoring for 25 minutes. Following a touch kick which found touch in the line, Guy's scored and had hard luck in not converting the ball resulting from the cross-bar. A few minutes later F/Lt. Maxwell nearly placed a penalty goal from 40 yards out.

On restarting the R.A.F. forwards were playing to their backs and Guy's were thoroughly extended in defence. Their full back played a particularly sound game and his touch finding sent the Air Force back again and again. From a loose scrimmage F/O. J. I. T. Jones put W. Jones away. The

latter, running strongly, found himself hemmed in near the touch line and passed to F/Lt. Bryson, who scored between the posts, Maxwell converting.

The R.A.F. then began to get the ball freely and had their backs not passed standing still they might have scored again. During the last five minutes by judicial use of touch Guy's worked back to the R.A.F. line and, following a scrummage outside, scored a try, the goal kick failing.

The R.A.F. team was as follows:—F/O. T. L. Lowe, back; F/O. H. M. Storr, F/O. W. Jones, F/Lt. O. C. Bryson, and Cdt. P. B. Forster, three-quarter backs; F/Lt. M. K. H. Brown and F/O. J. I. T. Jones, half-backs; F/Lt. W. W. Wakefield, F/Lt. G. H. H. Maxwell, F/Lt. S. P. Simpson, F/Lt. R. H. C. Usher, S/Ldr. W. C. Hicks, F/Lt. R. F. Turner, Sgt. Smith and F/Lt. L. Whitworth, forwards.

### Manston.

RUGGER.—A match was played on Jan. 4th against R.E. Chatham at Chatham and resulted in a win for the Sappers by 1 goal 2 tries (11 points) to nil. Manston played one man short. In the first half against the wind the Manston forwards held their own, all points being scored in the second half.

The Manston team was as follows: Full back, F/O. McAlery; three-quarters, F/O. Hall, A.C. Middleton, F/O. Riddle, F/O. Tinsley; halves, F/O. Hamay, Cpl. Clayton; forwards, F/Lt. Turner, F/O. Saunders, F/O. Savile, S/M. Beattie, Cpl. Travers, A.C. Benson, A.C. Ross.

### Uxbridge.

Under the guidance of F/Os. Stack and Lane a variety entertainment was given in the Lecture Hall at the R.A.F. Depot on Jan. 12th and 13th.

As is usual with Service concert parties and particularly with those connected with the Flying Services a really clever show was given, the star turn of the entertainment being Craig and Tubby in a "Roman Burlesque." The excellent dialogue, clean and sparkling wit, together with the general ensemble, was worthy of highly trained professional actors.

"De Wit," lightning sketch artist, was another outstanding feature of a most enjoyable programme, and the impromptu efforts of three of the officers fully merited the hearty applause which they received.

The promoters have every reason to be proud of their achievement and it is hoped that others may come forward and help to make the party a permanent feature of Depot life.

### Henlow Notes.

RUGGER.—Duxford visited us on the 11th and were beaten (8—3), after a thoroughly enjoyable and sporting game. On Saturday we were distinctly unlucky to lose to Olney Town (8—3). We had the assistance of F/Lt. Maxwell in this match and his example and advice should be of invaluable help to our forwards, who are already a useful pack.

SOCCER.—"A" team now head the Bedford District League and will remain in that position. On Saturday they accounted for Kempston Rovers (5—0). "B" team drew with Potton Town (1—1).

HOCKEY.—No matches last week. On Wednesday our team drew with a scratch lot of officers and airmen (2—2). The latter had the assistance of A.C. Jerdon who plays half-back for "A" soccer team. He is one of the most useful hockey players on the station.

RIFLE RANGE.—The new indoor range was opened on the 12th. In the C.O.'s absence on a short Stores Course at Knislip, the first shot was fired by the Adjutant. It proved a "ball" and was quite unwarrantably regarded with intense suspicion by the most knowing element amongst the spectators—to wit, the Adjutant's wife. A prize for the best score made on the opening evening was won by Serjt. Delaney.

GENERAL.—The annual general meeting of the Astra Athletic Club was held on the 16th inst.; Wing/Cmdr. Hebbden presided. The financial statement showed the club to be flourishing. A successful Airmen's Dance was held on the 13th. F/O. I. A. Gray from Middle East Area has been attached for temporary command of Flight Test and Despatch Sub-Section.

### SOARING COMPETITION IN SWITZERLAND.

A soaring flight competition is to be held by the Central Swiss section of the Swiss Aero Club at Gstaad, Bernese Oberland, from March 8th to 15th, 1922.

In connection therewith a course of instruction in practical soaring is being arranged at Gstaad from Feb. 15th to March 15th.

Intending participants in the competition should communicate with the Secretary, the Royal Aeronautical Society, 7, Albemarle Street, London, W.1.

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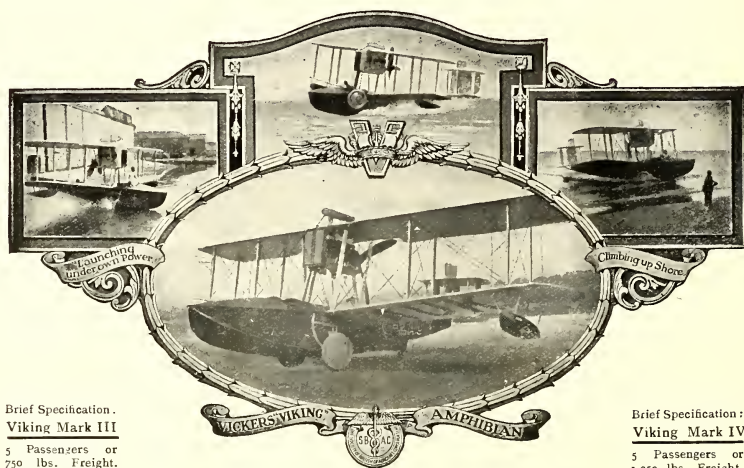
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# AERONAUTICAL ENGINEERING

SUPPLEMENT TO "THE AEROPLANE"

INCORPORATING AIRCRAFT ENGINEERING, AERODYNAMICS, AIRCRAFT FINANCE AND COMMERCIAL AERONAUTICS AND MATTERS PERTAINING TO THE AERONAUTICAL ENGINEER AND THE AIRCRAFT TRADER.

## THE WEEKLY COMMENTARY.

Wing Commander Beatty's recent paper dealing with the design of specialised aircraft, and the discussion on that paper, are discussed below.

The Technical Editor has taken the opportunity of appending to a somewhat destructive criticism of the modern business man a distinctly constructive essay on the design of passenger seats.

One or two other matters of some importance are also discussed in the interim.

Photographs and short descriptions of two new machines are given in this issue. Of one—a new Fairey—very little information is available, but the fact that

this machine, which is a seaplane, has an excellent performance carrying 20 lbs. per h.p., of which no less than 43 per cent. is disposable load, is a clear indication of the truth of the doctrine—so often inculcated in this paper—that important improvements in the efficiency of aircraft are possible if only designers will make intelligent use of the qualities of high-lift wings of various types.

The second machine—of American origin—seems to be a thoroughly sound design for comfortable passenger transport in conditions where high speed is of secondary importance.

## THE PROBLEM OF THE PASSENGER AEROPLANE.

The paper by Wing Commander Beatty on "Specialised Aircraft" which was summarised in the last issue of "Aeronautical Engineering" dealt with it will be remembered almost entirely with the problems of commercial aircraft, and the discussion thereon was confined to this aspect of the paper. This discussion is reported below, is commented upon, and, in addition, a certain number of points which the paper raises are considered in further detail.

### THE DISCUSSION.

Major WIMPERIS (Chairman) said that Commander Beatty asked that stones be thrown at him. He thought Sir Samuel Instone might like to throw the first.

### THE COMMERCIAL EYE.

Sir SAMUEL INSTONE said that the habit of looking at affairs with the cold commercial eye did not seem to appeal to the technical man. [In this matter Sir Samuel appears to have fallen into an error common to the merely commercially minded. The average commercial eye can see so little beyond the immediate prospect of making a profit that no competent technical man is likely to be led astray by its myopic hallucinations.—Ed.]

The commercial aspect was however of vital importance. If he had known how much Wing Commander Beatty knew about commercial aviation he would have treated him with greater respect in the past. He would know better in the future. The real commercial machine had not arrived and could not arrive until aircraft builders received adequate encouragement from the proper quarter. The few financiers who had sufficient imagination to put money into aviation had been bled white by taxation and had not the resources available. The proper quarter from which encouragement should come was the Government. The Government only proposed to spend £200,000 out of a total of £16,000,000 on commercial aviation, which was ludicrously inadequate when it was considered that little countries like Czechoslovakia were spending twice as much, and France, at the present rate of exchange, was devoting £3,000,000 to commercial aviation. Even so the object of the Air Ministry seemed to be to save out of that miserable £200,000. Commander Beatty had thought of everything necessary to making aviation comfortable for passengers, but even with all these improvements civil aviation could not be made to pay without Government assistance.

[There was a period in the history of marine transport when subsidies were invented in foreign lands to induce the inhabitants thereof to vie with the enterprise of British merchants. Of recent years subsidies have been re-invented to persuade British merchants to show a little enterprise for foreigners to emulate. It is perfectly natural that Sir Samuel Instone having been "bled white" should regard it as right that others be "bled whiter" still in order to reincarnate his corpuses, and it is quite likely that a little more bleeding of some of our commercial magnates—if the products were

efficiently applied—might serve to revivify not merely aviation, but the whole commerce of the country. But it is just those commercial magnates who ought to have the imagination and the foresight to put their capital into novel industrial experiments—who not only refuse to do so, but wail loudest when the Government proposes to do some of their work for them, if incidentally that involves using some of their money for the purpose.—Ed.]

He was always pleased to give technical men facilities in the way of free tickets on his machines. The demand for such facilities was very small.

### TWIN-ENGINED MACHINES.

He was very glad to hear Commander Beatty admit that twin engine machines had their advantages. They had single engine types imposed on them by the authorities, but there was a strong public prejudice in favour of twin engine types, and this must be considered.

Mr. HANDLEY PAGE said that recollecting the condition "Let him that is without sin throw the first stone," he was perhaps qualified to throw the second. He was afraid Commander Beatty had got an avalanche rather than the stone he had invited.

Commercial machines of the future would be very highly specialised indeed. The main feature would be enormously decreased resistance, leading to normal flight at only a small fraction of their maximum power and so making for greatly increased reliability. The comfort of passengers was undoubtedly a major consideration. The passenger after all pays and has to be satisfied.

He would like to extend to all designers an invitation to sample trips in his machines—but he would warn them that he might not always have as much room as Sir Samuel Instone.

Regarding twin engine types he had just been told by a well-known member of the Royal Aero Club that he personally was responsible for the most damnable contraption ever put into the air—the twin-engined machine—but that same gentleman had admitted his willingness to fly in one again if offered a free passage. The details as to heating and ventilation given by Commander Beatty were very important and interesting.

Major C. C. TURNER took objection to the lecturer's statement that Britain was too small for internal air communications. London to Glasgow, 400 miles, was quite a long enough stage, and there were many others. The statement that commercial aviation did not pay was worthless when it was based only on one route with only 95 miles over British territory. You could not make a success of so big a business on so small a scale. There was no doubt that the public preferred twin engine machines, but that preference was based on faulty information. A good twin engine machine was better than a bad single-engined one, but some twins now running were not safe.

Major KENNEDY expressed regret that nothing had been said in the paper about goods and parcel carrying machines. One got no traffic on any route by road or rail till one put down the route and then waited for traffic to grow. There was a great future for parcel and goods traffic and it seemed that our rulers had no imagination left otherwise they would take steps to develop this traffic.

[Why it should be the business of our rulers to display commercial enterprise and imagination and not of our business men one cannot say. But as our rulers always have done their best to stifle new transport enterprises by legislative restrictions, there is little doubt that Major Kennedy's charge against them is true. But private enterprise in the past has successfully combated our rulers, and here it must do so again.—Ed.]

Sir SAMUEL INSTONE here interposed the remark that his company had ordered three special goods-carrying machines. Passengers did not like, and should not have, to travel in a luggage van.

#### RESEARCH.

Major WIMPERIS, before calling on the lecturer, wanted to draw attention to the importance of research. There were many possibilities which could only be opened up through that agency. There was the question of whether we should continue to know the aero engine in its present form. There was the purely engineering development of a complete change-over to air cooling. There was the physical fact that it had been shown that steel in its ideal state should be ten times as strong as it actually was. Unfortunately at present it could not be persuaded to stop in that ideal state for more than a minute or two, but that was not necessarily final. As to silence, research showed that the simplest silencer—a long exhaust pipe pierced with numerous small holes, was as efficient as any. Silencing aircraws was a more difficult problem—it may be impossible—but experiment showed hopes of success. The salvation of civil aviation would be effected as much by careful research as by the expenditure of much money.

Wing/Cmdr. BEATTY in reply said that he was none the worse for the stones thrown. Research was of great importance, but he asked designers not to wait upon its results. A happy experiment sometimes gave the result where years of research had failed. The failure to refer specially to goods carrying machines was due to the fact that existing machines were reasonably suitable for the work, but not for passenger work. He was sorry to hear that designers did not take advantage of Sir Samuel Instone's offer of free passages.

#### SUNDAY COMMENTS ON THE PAPER.

There are a number of points raised both by the paper itself and by the discussion which are worthy of further attention.

The lecturer suggested the desirability of demonstrating on the vile bodies of aeroplane designers the many discomforts endured by passengers. Both Sir Samuel Instone and Mr. Handley Page offered facilities for such demonstrations, but there seems little response to the invitations on the part of designers. This is scarcely as surprising as it at first seems.

#### DESIGNERS AND FLYING.

With one or two exceptions designers have a fair amount of flying experience behind them. Most of this experience has been in open type aircraft, and the majority of those with such experience find cabin machines unbearable. To some slight extent this objection is psychological. The sound and feel of flying in a cabin is entirely different to that in an open cockpit, and to anyone with a fair experience of flying very terrifying. This makes it difficult to appreciate the real discomfort of the average cabin, though that nevertheless produces on the designer as on the passenger the physical disturbances which result from cold, foul air, and frigid, and still further increases his mental distress. And as a result there is a feeling that passengers have very curious ideas of comfort, but that if they insist on being boxed up in a cabin, well, that's their lookout.

#### SILENCE OF TWO TYPES.

Wing/Cmdr. Beatty remarks on the fact that effective silencers were desirable attributes in 1912, and are still not in use. It seems curious that a demand of such long standing should not have been satisfied, but it is not really so remarkable as it seems, nor does it indicate that there are insuperable difficulties to be overcome to supply the demand—so far as Civil aircraft are concerned at least.

As a matter of fact the two demands are essentially different. The military demand for a silenced machine was for a machine that could not be heard from the ground. It was very soon found that although one could do a great deal to silence exhaust, a machine so silenced was just as audible from the ground at any reasonable height or distance as the unsilenced type. As a matter of fact at any distance the high notes produced by aircraw and by the whistling of wires are clearly heard, while the exhaust bark is very largely damped out. The passenger demands silence on the machine itself.

No vehicle yet built is absolutely silent, but certainly it is possible greatly to reduce the volume of sound on the machine—firstly by fitting a proper exhaust silencer. Here again the average designer is so used to noise that he has probably given up thinking about it. In this connection it should be remembered that improved aerodynamic efficiency would help greatly. If one can put the weight per h.p. of the standard commercial machine up from 16 lbs.—its present figure—to say 30 lbs. (which is by no means an unlikely figure for three years hence), there will *ipso facto* be less noise than there is at present. Also it will be possible to spend a little more weight on such refinements as silencers.

#### THE IMPORTANCE OF IMPROVED EFFICIENCY.

As a matter of fact improved aerodynamic efficiency is the root problem of the whole matter. With engines now available one can have 1 h.p. with about 4 hours' fuel installed for a total weight of  $\frac{4}{3}$  to 5 lbs. For each h.p. one has, in modern commercial machines, about 5 lbs. of aeroplane, and about 5 lbs. of disposable load. From this 5 lbs. of disposable load one has to subtract each addition made for the comfort of the paying passengers and the remainder is paying load. That is, in a 450-h.p. machine of to-day the designer has round about 1 ton wherewith to play. If he could just drop passengers into the machine and let them hang on to what ever was handy he should carry roughly 15 passengers. By the time he has provided even the present day type of cabin, seats, and the like his ton of passengers has fallen to not much more than two-thirds of this weight. An extra pound per h.p. spent on comforts means another three passengers lost, and it does not take a lot of silencing, heating and ventilating gear to weigh 450 lbs.

Therefore one may fairly safely say that until the practicable weight per h.p. of aeroplanes is increased appreciably, it will be difficult to compete with other forms of transport in this matter of comfort.

Nevertheless the subject should be given every attention, and there is no doubt that without appreciably increased weight a good deal of improvement is possible, and in any case it is wise to take thought for the morrow and to consider in what manner the requisite comforts can be provided at the minimum weight.

Take for instance silencing and heating. As Wing/Cmdr. Beatty points out, the exhaust gases are the obvious source for heating supplies. Heating from the exhaust implies cooling the exhaust itself, and cooling the exhaust is one large step towards silencing it. It is therefore obvious that the exhaust heated boiler for the radiators should form part of the silencer system—and, in fact, it can probably be made to be the major part of it.

#### THE DESIGN OF SEATS.


In raising the question of seats, Wing/Cmdr. Beatty has touched upon a distinctly sore point, and also a distinctly difficult problem. It is not the case that no scientific study has been given to the question of seat design. In connection with the design of seats for public transport vehicles, particularly traucaurs, a very considerable amount of research has been carried out. The results lead one to believe that the load per sq. in. of passenger base has considerably less to do with his comfort than have a number of other factors.

The actual shape of the seat is important, but the best shape varies according to conditions, particularly conditions of leg room available. It is absolutely impossible to make any seat comfortable for an appreciable number of people to sit with the legs vertical from the knee downwards, unless one can lean forward on fore arms or elbows. Otherwise it is essential that one should be able to lean well back and stretch one's legs forward.

Under these conditions the best seat shape is one with a leading edge slightly convex upward and thereafter sloping down to the back at about 10 deg. The back should be sloped backwards at more than a right angle to the plane of the seat—that is, if the seat is inclined 10 deg. from the horizontal the back should be at least 15 deg. from the vertical. The back must reach to the shoulder blades at least. The lower the seat, provided the leg room is ample, the greater should be the tilt back of the whole and the greater the angle between seat and back. Individual variations in length of leg make a lot of difference to the best sitting. Seats therefore should, if possible, be adjustable as to slope both of seat and of back to suit the passenger's proportions.


But the greatest fallacy as to seats is the idea that cushions add to comfort. Fatigue from sitting for a long period is due not so much to excess pressure on part of the anatomy as to steady and long continued pressure on the same part. A cushion merely secures that however much one may fidget the load distribution remains practically the same.

For relatively long sittings in fairly cramped positions the most comfortable form of seat is that used by some tram and bus undertakings, consisting of narrow laths on edge alternating with spaces. Both laths and spaces are about  $\frac{1}{2}$  in. wide and the top of the laths is rounded to a semi-



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cylinder. The top surface of the seat is formed with a dipping front edge, and a fair slope backwards aft of it, and the back slopes considerably and is high enough to support the shoulders. These seats are comfortable because a shift of a fraction of an inch transfers the loading to a piece of flesh hitherto unloaded, and by a process of minute fidgetings the monotony from which the base usually suffers is avoided.

Unfortunately passengers who pay high fares for expensive forms of travel object to the appearance of this clean and comfortable type of seat, and insist on sitting on brightly upholstered, microbe infested and tiring cushions. This difficulty calls for the redesigning of passengers—a subject somewhat beyond the scope of these notes. For the moment attention to providing adequate leg room and the proper angle of seat and back are the only lines for advance.

It must be pointed out that this question of passenger comfort is one of very great importance. As the paper points out passengers will not travel in discomfort if they can avoid it, and all passenger transport cannot pay until comfort is assured. Such comfort can be given only as the result not only of attention to the details directly bearing on comfort, but of very considerable improvement in the aeroplane itself.

#### THE SIZE-LIMIT OF FUSELAGES.

Commander Beatty's final query as to the limits of size for

single-engined fuselages raises an interesting question. Obviously if one doubles the engine power one wants at least to double the passenger capacity. This means roughly doubling the floor space, but for equal air volume per passenger the head-room may remain constant. The floor space will be increased normally by increasing both length and breadth of cabin, and it will not be necessary to double the maximum cross-sectional area of the fuselage. Actually if cabin proportions of length to breadth are constant, the sectional area will be increased in the ratio 1 to  $\sqrt{2}$ . For the same airscrew revolutions the airscrew diameter should increase as  $\sqrt[3]{2}$ , and the airscrew disc area as  $\sqrt[3]{2}$ . So that the section of the body will tend to increase slightly more rapidly than the area of airscrew disc. This difficulty will inevitably be overcome, because there is a limit to the tip speed of airscrews, and the speed of rotation must decrease as the diameter increases. This means that as the power goes up the r.p.m. will come down, and therefore that the diameter can increase at a rate probably at least sufficient to keep the proportion of body section to airscrew disc constant.

There does not seem to be any serious fear of this particular difficulty interrupting the construction of still larger single engine types.

### A FAIREY LOAD-CARRIER.

The photographs show the new Fairey seaplane which has just put up so remarkable a performance. It follows very closely the lines of the standard type 3D of that make, but is fitted with one extra bay of wing bracing, and has a span of 62 ft.

The total weight loaded is 7,250 lbs., which is 20 lbs. per

h.p. with the 360 Rolls-Royce engine. Of that total the disposable load is 3,100 lbs. Under these conditions the machine handles well both on water and in the air, has a top speed of 95 m.p.h. and a climb of 350 ft. per min., and lands at 48 m.p.h., carrying over 10 lbs. per square foot of shoulders. These seats are comfortable because a shift of a wing surface. This may be regarded as an eminently

convincing demonstration of the value of the Fairey variable camber wing. Particularly interesting is the fact that the machine was ordered under a firm guarantee that a specified performance would be carried out within four months of the date of the order, and that this specification has been fulfilled with a small margin all round, and the machine has been designed, constructed and tested within that very limited period.

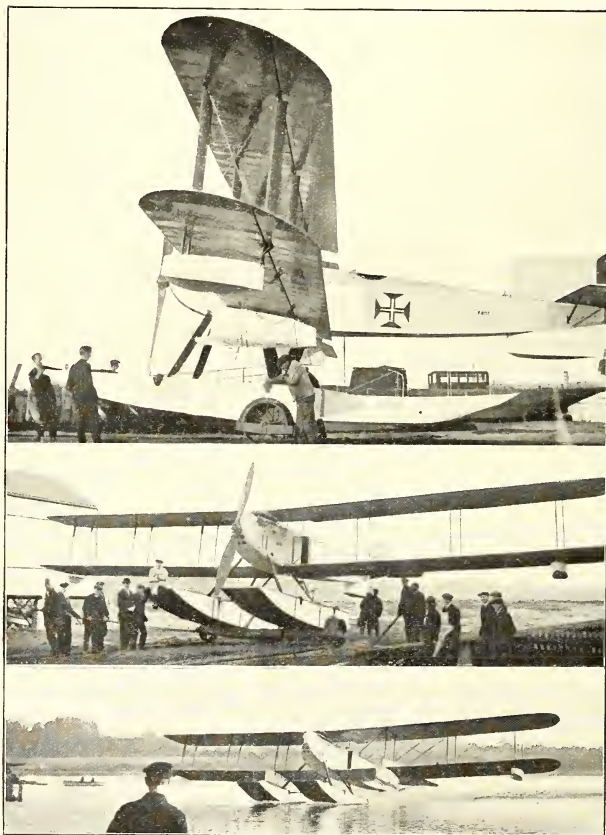
The total weight lifted is a record, certainly so far as England is concerned, and probably for the world, for a single-engine machine.

The enormous size of the floats necessary to carry the total weight on the water should be specially noted. The two wing-float-like objects under the inner set of interplane struts may be what they appear to be—but are probably connected with the special purpose for which the machine is destined. This purpose, however, is not yet available for publication.

But the machine appears to have available some capacity for carrying a reasonable number of passengers with enough surplus lift to provide those passengers with fair comforts.

The weight of pilot and of  $3\frac{1}{2}$  hours' fuel for the engine would amount to some 800 lbs., leaving 2,300 lbs. of the disposable load. The average passenger of railway and tramway practice runs 15 to the ton, but it is not possible to stow passengers in an ordinary fuselage, and cabins and cabin furniture necessarily weigh a good deal. But this machine could probably be equipped with a comfortable cabin fuselage and seats for 10 passengers, together with silencer and heating gear, for, at the outside, 500 lbs. It would then have a capacity for some 300 lbs. of luggage in addition to the 10 passengers.

This represents a larger paying load than that carried on present-day commercial land machines even with engines of 100 more h.p. It is true that the land machine has an appreciably higher speed—but it is equally true that it does not carry the excess weight and resistance represented in this case by the floats, which must weigh at least 300 lbs. more than a wheel undercarriage.



"The DH.18 is to-day without doubt the finest single-engined passenger carrier in actual regular service on any of the World's Air Traffic Lines. The type made its first appearance only in 1920, but there are already in existence machines of DH. design which will certainly supersede it."—*The Aeroplane*, Nov. 9th, 1921.

The new types referred to are the DH.32 and the DH.34, both of which will make their first appearance on the cross-Channel air lines in the Spring of 1922. These machines will embody every improvement suggested by our exceptional experience of the design, construction and operation of commercial aircraft.

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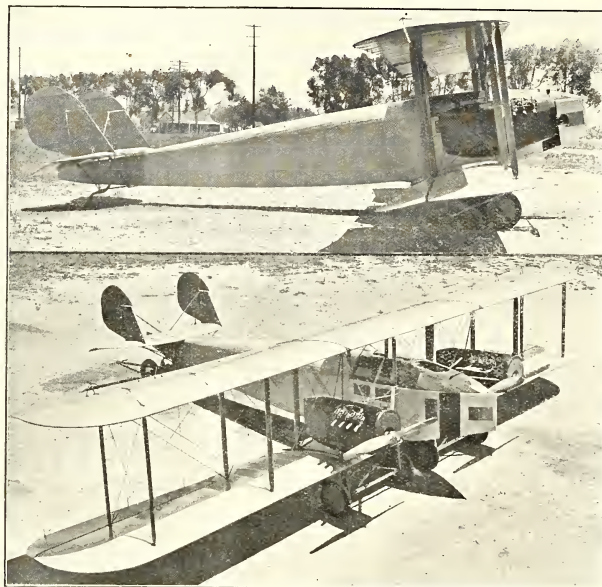
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**A NEW AMERICAN MACHINE.**—The photographs here reproduced show a twin-engined passenger carrier built by the C. R. Little Aircraft Works to the design of Mr. G. E. Barnhart. It is known as the Barnhart "Wampus-Kat." The engines are Curtiss O.X., 90 h.p. each.

The machine is fitted with a central cabin for four passengers, and carries a total paying load of 640 lbs. with 4½ hours' fuel.

It is claimed that the machine is extremely easy to fly, will keep the air on one engine alone, and is highly stable. Folding wings are fitted to permit of stowage in a small shed.

As the photographs show the machine is built on standard lines, largely of spruce and three ply, and appears from its performance to be a very sound example of the moderate speed transport machine for use in districts where communications are relatively undeveloped.

The main particulars of the "Wampus-Kat" are:—

Span 50 ft.; Chord 5 ft. 5 in.; Area 484 sq. ft.; Length 30 ft. 10 in.; Height 11 ft.; Span loaded 22 ft.; Weight, empty, 2,611 lbs.; Fully loaded 4,015 lbs.; Wing loading 8.23 lbs. per sq. ft.; Weight per h.p., 22.3 lbs.; Speed range 43.90 m.p.h.; Climb 3,500 ft. in 10 mins.; Ceiling 11,600 ft.

## HOME OFFICE REGULATIONS AS TO WOODWORKING FACTORIES.

A copy of the revised draft of the regulations which the Home Office proposes to make under the Factory Acts as to the proper fencing and so forth of woodworking machinery has just been issued, together with a statement that objections to these regulations must be lodged at the Home Office on or before Jan. 23/12.

These regulations affect all workshops wherein woodworking machinery is employed, and so practically all aircraft manufacturing works and all those concerned with the management of such works should take steps to become acquainted with the proposals at the earliest possible date.

Copies of the draft can be obtained from the Factory Department, Home Office, London, S.W.1. The reference number 405183/36 should be quoted.

## NOTICE TO GROUND ENGINEERS.

No. 7, 1922.—MAINTENANCE OF A.V. 8 & A.V. 12 TYPE MAGNETOS. It is hereby notified:—The following precautions should be observed with A.V. 8 and A.V. 12 type magnets:—

1. *Lubrication*.—Before starting up an engine fitted with a magneto which has been drawn from store or has not been run for some time, care must be taken to ensure that the oil well of the distributor bearing, which is of the plain phosphor bronze type with wick lubrication, is filled, by passing approximately a teaspoonful of oil down the left-hand hole in the oil cap at the distributor end of the magnetofacing the distributor). Six drops of oil should also be injected into each main bearing through its respective oil cup; one or two drops to the contact breaker cam lubricating pad, and one drop to the contact breaker pivot pin. To effect the last, it is only necessary to move the retaining spring to one side.

This provision of oil should normally be sufficient for twelve hours' running. Thereafter, at similar intervals, twelve drops of oil should be given to the distributor gear wheel bearing, with treatment of the other bearing as stated above.

2. *Contact Breaker*.—The gap between the contact breaker points should be maintained within 0.013 in. and 0.011 in. A gap of 0.012 in. may be regarded as normal.

The contact breaker points, which are slightly convex, should be cleaned, if necessary, with very fine emery cloth, care being taken to ensure that no emery dust is left on the contact breaker. A file should not be used for this purpose; a soft brush is convenient for cleaning the contact breaker.

3. *Distributors*.—In changing the magnetos on an engine, it is essential that the original distributor block should be removed, and the new magneto attached complete with its own distributor. The changing of a distributor block from one magneto to another is most undesirable, owing to the possibility of the rotor brush fouling the distributor segments, due to the small gap between these parts and to the working tolerances necessary on the distributor, end plate, gear centres, etc.

The setting of the spark gap between the rotor main electrode and the distributor segments must be correctly maintained within the limits of 0.010 in. and 0.015 in. Normally it should be unnecessary to interfere with this gap, which is correctly set for each individual magneto before its despatch from the maker's works.

4. *Hand Starter Terminal*.—Care must be taken, when fitting the starter lead to the distributor, that the terminal screw is properly locked by the spring strip provided for the purpose. The screw should

be tightened by a box spanner which at the same time will press down the spring clear of the hexagon; on release, the spring should lock the screw, the latter being turned slightly, if necessary, to ensure this. No part of the screw or the locking spring must project beyond the face of the distributor.

Air Ministry, Jan. 5/12.

## THE AFFAIR OF THE SILVER STREAK.

In an article which appeared in THE AEROPLANE of Nov. 6th, 1921, dealing with the Short all-metal machine, it was deduced from the history of that machine that the authorities of the Air Ministry were not particularly interested, and I desired if anything to relegate it to that large limbo wherein are to be found the remains of much neglected enterprise.

It is very pleasing to discover evidence that this deduction was unfounded. It may be surmised that the occasion of the delay which occurred was not so much lack of interest on the part of the authorities as the absence of an authorised procedure for dealing with exceptional types of aircraft.

Thus different departments showed their interest in the apparatus by evincing a desire to operate upon it in a manner to satisfy their own particular desire for information and in the special circumstances of the case there was room for lengthy argument as to procedure, and many demands for "rulings."

In the meantime a very searching series of tests of the structural resistance of the "Silver Streak" have been made at Farnborough with highly satisfactory results.

Now however the affair has been reduced to order, and the official interest has shown itself in the very satisfactory form of a definite order to the firm of Short Bros. for two all-metal machines of similar construction.

It is understood that the new machines are to be modified as to their load carrying capacity, etc., so that they will by no means be replicas of the original "Silver Streak."

## CAPRONISMS.

Recently rumours have appeared that the Caproni firm were again building a big triplane on the lines of the machine which disappeared in Lake Maggiore. One learns from Italy that this rumour is entirely untrue. Both the Caproni brothers are away from Milan and the Caproni works at Vizzola, near Lake Maggiore, and at Taliedo, near Milan, are both closed down, no work having been done for several months. There has been some talk of building a super-Caproni in America but so far the operation has consisted only of talk.

## MORTGAGE.

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# COMMERCIAL AERONAUTICS

## AND CIVIL AERIAL TRANSPORT.



### THE UNITED KINGDOM OF GREAT BRITAIN AND IRELAND.

#### CONTINENTAL ARRIVALS AND DEPARTURES.

[The following table of arrivals at and departures from the British Air Ports is compiled on the following system:—First comes the initials of the Air Line; next the type of machine; next the international number of the machine; next the ports of departure and destination; next the times of departure and arrival; next the cargo, whether goods (G) and/or mails (M); next the number of passengers; and finally the name of the pilot and number of mechanics, if any.]

ABBREVIATIONS:—A.D.—Aircraft Disposal Co. B.A.—Berkshire Aviation Co. B.C.—Bristol Aeroplane Co. B.M.—Brompton Motor Co. C.A.—Department of Civil Aviation. D.H.—De Havilland Aircraft Co. G.E.—Compagnie des Grands Express Aériens. H.P.—Handley Page Transport Ltd. I.L.—Instone Air Line. K.L.—Koninklijke Luchtvaart Maatschappij. L.A.—Leatherhead Aviation Services. M.A.—Messageries Aériennes. M.W.—Marconi Wireless Telegraph Co. Ltd. P.O.—Privately owned. P.L.—Peters Ltd. S.F.—Surrey Flying Services. S.N.—Syndicat National pour l'Etude des Transports Aériens (S.N.E.T.A.).

#### The London Terminal Aerodrome, Croydon. (Telephone: Croydon 2720.)

##### JANUARY 9th:

I.L., DH8, G-EAWW, London-Paris, 12.45-15.25, G.M., Nil, Powell & I.  
I.L., DH8, G-EAWG, Paris-London, 12.08-15.12, G., 7, Robins & I.

##### JANUARY 10th:

I.L., Vimy, G-EASI, Ldn-Paris, 12.55-14.11th, G.M., Nil, Courtney & I.  
I.L., DH8, G-EAWW, Paris-London, 12.40-15.35, G., 4, Powell & I.  
M.A., Spad, F-ACMII, Paris-London, 12.55-16.35, G.M., 2, Le Sec.

##### JANUARY 11th:

G.E., Goliath, F-GEAI, London-Paris, 11.40—, G., 1, Mire & I.  
M.A., Breguet, F-CMAR, London-Paris, 11.40-15.55, G., Nil, Delage.  
I.L., DH8, G-EAWW, London-Paris, 12.04-14.10, G.M., 1, Robins & I.  
H.P., HP, G-EAII, London-Paris, 12.07-14.21, G., 2, Rogers & I.  
M.A., Spad, F-ACMI, London-Paris, 12.23-14.30, G., 1, Le Sec.  
A.D., DH8, G-EBAO, London-Brussels, 14.26-16.07, Nil, Nil, Foote.  
G.E., Goliath, F-GEAO, Paris-London, 12.15-15.45, G., 2, Chakmabel & I.  
I.L., Vimy, G-EASI, Paris-London, 12.55-16.23/14th, G., 1, Courtney & I.  
M.A., Spad, F-ACMIE, Paris-London, 12.57-16.20, G.M., 1, Challoux.

##### JANUARY 12th:

G.E., Goliath, F-ADDT, London-Paris, 11.57-14.16, G., 1, Chakmabel & I.  
H.P., DH8, G-EAWH, London-Paris, 12.34-14.20, G.M., Nil, Olky.  
M.A., Spad, F-ACMF, London-Paris, 12.35-14.45, G., 1, Challoux.  
I.L., DH8, G-EARO, London-Paris, 13.10-15.15, G.M., 3, Courtney & I.  
D.H., DH8, G-EAXG, London-Madrid, 13.16—, Nil, Nil, C. D. Barnard.  
I.L., DH8, G-EAWW, Paris-London, 12.15-15.35, G., 3, Robins & I.  
G.E., Goliath, F-GEAD, Paris-London, 12.15-16.25, G., Nil, Favreau & I.

##### JANUARY 13th:

H.P., DH8, G-EAWH, Paris-London, 11.20-15.45, G., Nil, Olky.  
M.A., Spad, F-ACMIE, Paris-London, 12.55-16.33/14th, G.M., 2, Portal.

#### The London Terminal Aerodrome.

Fog and generally foul weather, not unaided by the new simplified code used by the French Meteorological authorities, interfered seriously with activities at Croydon during the past week, and very little of note occurred.

On Friday Mr. Courtney reached Lympe from Paris on a D.H.18, Croydon being unsuitable for landing—or indeed any other aerial purpose—and no outgoing machine having left, he returned to Paris early on Saturday, in order to make the regular Saturday Paris-London run.

On Saturday morning, with very reasonably fair weather, the air was quite busy. Some pilot—alleged to be Major Foot, though he himself denies the imputation—put a Disposal Company's "Snipe" through its repertoire of stunting, and between 11.30 and 12.30 no less than five aircraft departed for Paris and one for Brussels. The latter was a D.H.9 bearing Belgian military colours plus civil registration marks.

On this morning the new French weather code produced some of its happiest effects. According to the reports Abbville was enjoying a thick fog with a visibility of 4,000 metres, and at another French station 70% of the sky was covered by low clouds, although according to the same report there were no low clouds. A series of interrogations on the copy posted at Croydon suggests that there were included a number of other jests which the receiving office had failed to grasp in their entirety.

Judging from the fact, reported in the Press, that Mr. McIntosh was forced to land at Surville in thick weather

##### JANUARY 14th:

M.A., Spad, F-ADAE, London-Paris, 11.24—, G., Nil, Robyn.  
M.A., Spad, F-ACMIE, London-Paris, 12.01-14 Croydon, G., Nil, Portal.  
H.P., HP, G-EATN, London-Paris, 12.03—, G., 2, McIntosh & I.  
I.L., DH8, G-EAWW, Ldn-Paris, 12.15-13.45/16th, G.M., 4, Holmes & I.  
G.E., Goliath, F-GEAO, London-Paris, 12.16-15.05, G., 1, Favreau & I.  
G.E., Goliath, F-ADDS, Paris-London, 12.05-14.20, G., 4, Mire & I.  
I.L., DH8, G-EARO, Paris-London, 12.12-14.20, G., 2, Courtney & I.  
H.P., HP, G-EAII, Paris-London, 12.50-15.36, Nil, 7, Wilcockson & I.

##### JANUARY 15th:

Nil.

#### Inland Flying at Croydon.

Jan. 6th.—Nil.  
Jan. 10th.—R. A.C.C., Avro, practice (Mrs. Atkey); D.H., DB9, Stag Lane (C. D. Barnard).  
Jan. 11th.—R. A.C.C., Avro, practice (Mrs. Atkey); D.H., DH9 from Stag Lane (C. D. Barnard).  
Jan. 12th.—S.F., Avro, Joy-rides (Muir); Miss Parbury, Westland test (Muir).  
Jan. 13th, 14th, and 15th.—Nil.

#### Cross-Channel Statistics.

Week ending January 14th:  
Machines, 37; Passengers, 31; Crews, 50; Total Personnel, 102  
Corresponding week last year:—  
Machines, 27; Passengers, 30; Crews, 32; Total Personnel, 62

and crashed on an unnamed obstacle, suffering slight injuries in the process, one must admit the success of the new French weather code.

#### AN ERRONEOUS STATEMENT.

A letter from the Instone Air Line Ltd., dated Jan. 12th, 1922, denies explicitly the rumour published in THE AEROPLANE of Jan. 11th, to the effect that certain other aircraft interests are concerned with the firm. The Instone Air Line Ltd. state that neither Vickers Ltd. nor any other aircraft manufacturers are in any way directly or indirectly financially interested in their company, and that it is not true that the firm will use only Vickers machines, but that they are, as hitherto, free to select all the best types of British commercial machines, not being allied to any firm of manufacturers in any way.

It has always been the aim of THE AEROPLANE to be irreproachably accurate in its statements, more especially where they concern any business firm. During its ten years or more of existence THE AEROPLANE has devoted itself entirely to fostering British Aviation and to helping in every possible way the British Aircraft Industry, whether concerned with the construction or operation of aeroplanes.

It is to the unusually high standard of accuracy which has been maintained in THE AEROPLANE that this paper owes its high reputation in the opinion of all those concerned with aeronautics, both at home and abroad. Therefore one regrets all the more that an inaccuracy of this nature should have inadvertently appeared in THE AEROPLANE, and one tenders sincere apologies to the Instone firm and to the readers of

# INSTONE AIR LINE

51, LEADENHALL STREET, E.C., and  
LONDON TERMINAL AERODROME, CROYDON.

Telephone: AVENUE 3616.

THE AEROPLANE for having allowed the rumour in question to appear in print.

### Wellington (Salop)

The Berkshire Company visited Wellington for the Christmas holidays where they were flying from a field off the Adunaston Road. Very rough weather was experienced, especially on Boxing Day, when 50 passengers were carried in a 40-m.p.h. gale. At times the machine was observed to be flying backwards.

### Wem (Salop)

Flying in a gale from Wellington the Berkshire Aviation Co. arrived at Wem on Dec. 30th. On New Year's Day 3,000 people were on the field to witness the exhibitions advertised for 3-15. Only 35 passengers were carried, a strong wind no doubt "putting off" would-be fliers. Messrs. J. D. V. Holmes and J. C. C. Taylor "walked the wings" at 1,500 ft., as below 1,000 ft. the 'bumps' were terrific.

Cross-country flights have been in great demand here. On New Year's morning Mr. Robert Ryley, a well-known local gentleman, and a friend flew over to Hawkstone golf links to play off a match and were picked up later in the day. Several flights have been made to Whitchurch, Nantwich, and Shrewsbury.

The firm's Avro G-BAKX has just completed 400 hours' flying and is still good for another 400. "Wilfred," the canine member of the firm, who has now flown over 1,000 miles, is of great value. His daily routine is driving all stray dogs off the 'drome, greeting passengers as they return from flights and digging up the 'drome in his search for "big game," usually consisting of field mice!

The B.A.C. left Wem on Thursday last for Whitchurch, where they are giving exhibition and passenger flights.

### Clown.

In the week ending Jan. 8th the Berkshire Tours (Mr. Fred Holmes and Mr. Brian Ferrand) carried 176 passengers, 127 of whom were taken up on Saturday and Sunday. There was a crowd of about 2,000. Most of the passengers were colliers from the Shireoaks coal pit.

### THE AIRCO MEETING.

The Times of Jan. 10th published the following facts.—Sir William B. Post, the Liquidator, in presiding at a meeting of creditors of the Aircraft Manufacturing Company, at Winchester House, E.C., on Jan. 9th, said that until 1920 the company had a prosperous career. After the existence existing contracts were cancelled, and a settlement was made with the Government for £645,000. The company received £446,000 in cash, and £193,000 was set off against existing claims. In the autumn of 1910 the company developed its

peace programme, and went in for manufacturing motor and gramophone bodies. From Oct. 1st, 1919, to Dec. 31st, 1920, the date of the Receiver's appointment, the company lost £620,000.

He gave details of eleven subsidiary companies, and estimated that there would be a loss to the Aircraft Company in respect of these of £800,000. Dealing with the assets which remained to be collected, he said that the main claim would be in connection with the Gnome and Le Rhone engines, the favourite engines used in war aircraft, and for which the company had never been adequately remunerated. Claims would, therefore, be put forward before the Royal Commission on Awards to Inventors amounting to £475,000 in respect of aeroplanes. Another claim for £200,000 would be made in respect of airship designs supplied to the Admiralty. He believed the Receiver would be able to recover the full amount of £200,000 paid by the company in excess profits duty.

The debenture-holders, whom the Court held had priority, claimed £666,000, of which they had received £100,000. Taking a broad view of the situation, there were, in his opinion, sufficient assets to pay off the debentures, and yield some surplus for the creditors. At this moment the surplus could not be estimated.

In a letter Mr. Holt Thomas, former chairman of the company, urged the prosecution of claims in regard to outside manufacturing work had used the firm's designs. The D.H. machines were favourites all over the world, and he believed the use of D.H. designs in the United States in peace time was a breach of agreement.

Mr. Patterson, chairman of the Inspection Committee, said there was need for investigation into the firm's subsidiary companies.

## PERSONAL NOTICES.

### Deaths.

THURSTAN.—On Jan. 7th, at Bournemouth, the result of war service, Francis Farnall Thurstan, late F.Cmder, R.N., the beloved husband of Hilda Alexandra Thurstan, of Chatsworth Lodge, Woodland Road, Weston-super-Mare, aged 41 years.

### ENGAGEMENTS.

CAILLARD—MORRAT.—A marriage is arranged, and will take place on Feb. 1st, at Farnborough, between F.O. B. Caillard, R.A.F., youngest son of Mr. and Mrs. Esmond Caillard, of Hove, Sussex, and Mary Lihan, eldest daughter of Mr. and Mrs. Morris, of Cotswold, Farnborough Park. DRUMMOND—TAYLOR.—The engagement is announced between Lt. Edward Morton Drummond, Black Watch, attached R.A.F., eldest son of Mr. and Mrs. Gerald Drummond, Duxley, Woodford, Essex, and Daphne Eunice, youngest daughter of Mr. and Mrs. Wilfrid Taylor, 12, Mitre Court Chambers, Temple.

### MARRIAGES.

BECK—LYNE.—On Dec. 22nd, at St. Woolles, Newport, by the Venerable the Archdeacon of Monmouth, Henry Wolferstan Beck, R.A.F., to Matilda Genevieve Lyne.

GORELL—RADCLIFFE.—On Jan. 10th, at St. Mary Abbots', Kensington, by the Bishop of Kensington, assisted by the Rev. Dr. Radcliffe and the Vicar of the Parish, Lord Gorell, C.B.E., M.C., Under Secretary of State for Air, to Maud Elizabeth Furze, eldest daughter of Mr. and Mrs. Alex. N. Radcliffe, of 45, Kensington Square.

KEITH—MONTGOMERY.—At St. Mary Abbots', Kensington, on Jan. 4th, 1922, by the Rev. H. D. L. Veiner, C.B.E., Chaplain-in-Chief of the R.A.F., to H. Keith, to Mary Angel Constance, elder daughter of Mrs. J. P. Montgomery, of "Gresmond," Warsaw.

### BIRTHS.

HUXLEY.—On Jan. 12th, 1922, at 42, Pimbridge Villas, Bayswater, W.11, to Freda (née Fascutti), the wife of F.O. J. H. Huxley, D.F.C., R.A.F.—a daughter.

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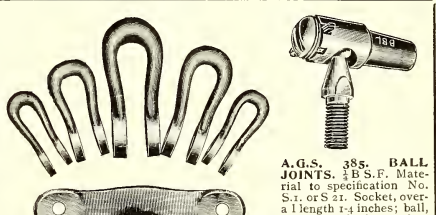
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## INDEX TO ADVERTISERS

Accies & Pollock, Ltd. ... .. 53	Cunard Line ... .. 56	Roe, A. V., & Co., Ltd. ... .. <i>Inside Front Cover</i>
Aircraft Disposal Co., Ltd. ... .. 51	De Havilland Aircraft Co., Ltd., The... .. 51	Rolls-Royce, Ltd. ... .. 49
Beardmore, William & Co., Ltd. <i>Inside Back Cover</i>	Fairley Aviation Co., Ltd., The ... .. 45	Rubery, Owen & Co. ... .. 55
Bray, Gibb & Co., Ltd. ... .. 56	Godfree, E., & Co. ... .. 53	Tait-Cox and James ... .. 56
Bristol Aeroplane Co., Ltd. ... .. <i>Back Cover</i>	Green Engine Co., Ltd. ... .. <i>Back Cover</i>	Titanium, Ltd. ... .. <i>Front Cover &amp; 53</i>
Brown Brothers, Ltd. ... .. 55	Instone Air Line ... .. 51	Vickers, Ltd. ... .. 46

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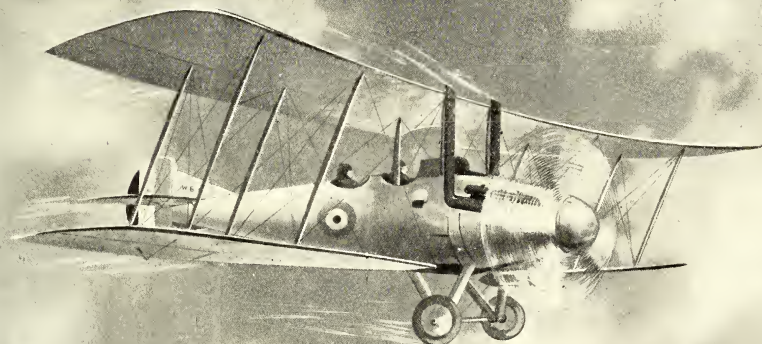
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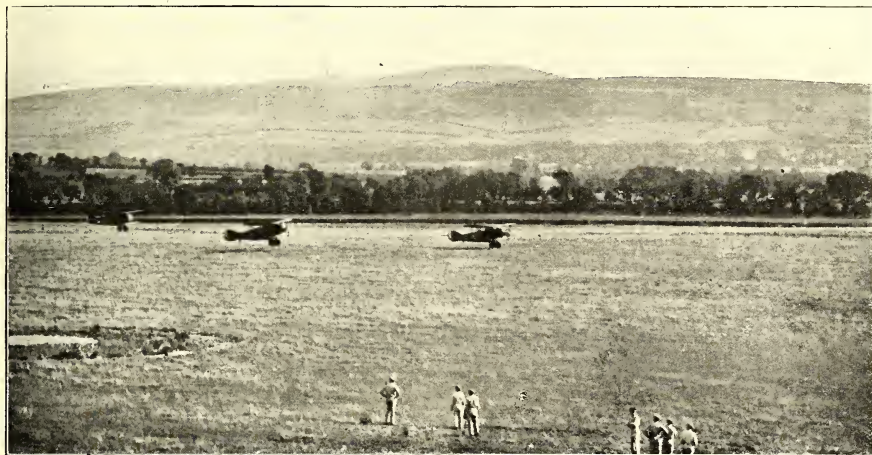
Edited by  
C. G. G. G.

Vol. XXII. No. 4.

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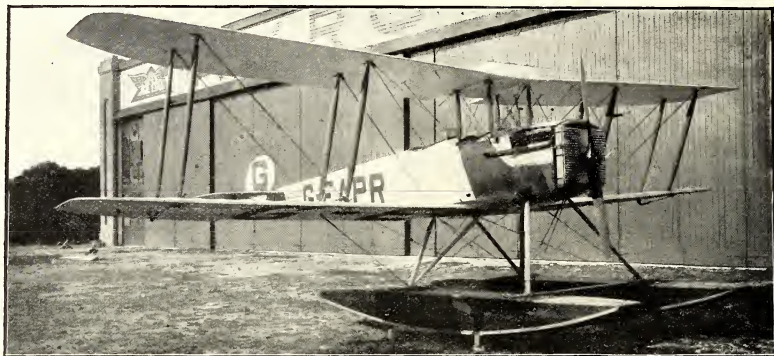
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## ON THE PROBLEM OF 1922.

Whatever 1922 may have in store for the R.A.F. and the Aircraft Industry it is bound to be better than 1921, though, as was set forth a few weeks ago, 1921 might have behaved very much worse than it did so far as aviation was concerned. Nevertheless the progress of 1922 may be merely somewhat better than that of 1921 or very much better according to how those in high places at the Air Ministry and in the Aircraft Industry handle the affairs committed to their care.

It has been written that man is master of his fate, but it is also true that there are circumstances over which he has no control—there is always one proverb or *cliché* which cancels out against any other. The truth lies midway between the two. The way to master fate is to dodge the circumstances which cannot be controlled and make the most of those which can be controlled.

Appropos which, a few days ago certain bright young men were discussing a great one on whom the present and future of British Aviation very largely depends, the discussion centring on his extraordinary faculty for giving apparently on the spur of the moment decisions which are of vital importance and invariably prove to be right. Some argued that he thinks so quickly that his calculations are practically instantaneous, something like those astonishing people who can give the answer to an elaborate sum in arithmetic as soon as the last figure is stated. Others said that he gives his decisions first and thinks out the reasons afterwards. Yet others said that he does not think, but that he is inspired like the prophets of old. And then a quiet thoughtful lad remarked, "Well, I think he just gives the decision and then bends the course of history to make it fit the decision."

Now, when you come to think of it, the man who can bend the course of events to make them fit the ends which he desires is a much bigger man than the lightning calculator or the man of inspiration. But in any case, what is most necessary to the progress of British Aviation in the coming year is decision. Ever since the Armistice aviation has suffered from lack of it, especially in the Aircraft Industry and in Civil Aviation.

So far as the purely militant side of the R.A.F. has been concerned there has been decision enough and to spare. The result is that in a little over three years after the cessation of hostilities an Air Force has been created out of chaos, so that despite shortage of money the R.A.F. is to-day not only the smartest and best air force in the World but is worthy to rank with the King's Senior Services. What is wanted now on the Technical side of the Air Ministry, in the Department of Civil Aviation and in the Aircraft Industry, is a spirit similar to that which has built up the R.A.F. And if that spirit is forthcoming there can be no doubt about that progress of British Aviation in 1922.

### The Technical Side.

To tell the truth there has been little enough cause for complaint about the Technical side of the Air Ministry. For the past two years it has done splendid work in developing new types of aeroplanes and engines for land and sea war (if not for air war) and also for civil aerial transport. But it might have put more drive into the work. Apparently it has spent too much time over making its calculations and coming to its decisions when it might have hastened progress by arriving quickly at decisions and hustling history to fit them.

One believes that much of this apparent delay has been caused by a certain disconnection between departments internally, and it seems quite likely that the re-organisation which has been progressing inside the Air Ministry for some months past will make a considerable difference in the future. At any rate the new Chief of Supply, Equipment and Research, and the new Director of Research inherit a sound basis on which to work and an able and enthusiastic staff with whom to work, so theirs is a great opportunity, of which they are just the men to make the best.

### The Civil Side.

It is in the Department of Civil Aviation that there seems to be the greatest need for improvement, and this fact is apparently appreciated elsewhere, for it is commonly reported that it is here where the "Geddes Axe" is most likely to fall. In fact there is much discussion as to whether there is any

need at all for a Department of Civil Aviation at the Air Ministry.

The lack of decision in this Department is shown by the way in which it has dealt with the subsidy question, first announcing that subsidies would only be paid on results (or by piece-work) and then under threat of political agitation or something of that sort consenting to pay by the trip (or by day work, fares or no fares). Also it has shown lamentable lack of decision in the way it has neglected to organise proper ground communications with aeroplanes on the air routes. One proposes to deal with those points more fully at an early date, for the benefit of those taking part in the Air Conference on Feb. 7th and 8th.

The question therefore is whether the work of this Department could not be distributed, along with the more efficient of the personnel, among other Departments. For example, inspection and licences could either be handled by the Board of Trade, which deals with the analogous affairs of the Mercantile Marine, or they could be handled by the R.A.F. much as the Admiralty deals with inspection of ships which are subsidised as auxiliary cruisers, and with the suitability of personnel for the R.N.R. and R.N.V.R. The Army deals much on the same lines with subsidised lorries for the R.A.S.C. and with the personnel of the Militia and Territorial.

Personally one sees no reason why "joy-ride" machines and pilots should not receive in return for belonging to an R.A.F. Territorial Reserve a small portion of the over-generous sum allocated for subsidies. They would be quite as useful for instructional purposes in case of war as ever the air liners and their crews would be for operations in the field, and probably more so.

In any case, there seems no reason why the R.A.F. should not deal with the efficiency of the matériel and personnel of Civil Aviation or with the finance of subsidies. We should then at any rate be sure of getting some value for our money, instead of as at present paying out tens of thousands a year merely for the very poor advertisement which is got from pushing obsolete machines across the Channel.

### International Affairs.

So far as international relations are concerned, one is convinced that the Overseas Trade Department of the Board of Trade would do all that the Department of Civil Aviation does, and possibly do it rather better. Even as it is one is strongly under the impression that a great part of the most valuable work attributed to the D. of C.A. is done by the Department of Overseas Trade. One refers to the reports on the development of aviation in foreign countries which are issued by the D. of C.A.

If the information therein is not supplied by the various local representatives of the D.O.T. one would be very much like to know who does supply it. And if it is supplied by the D.O.T. one fails to see why two sets of officials should be maintained merely so that one may transmit the information to the other who publishes it.

### Officials and Officialness.

So far as meteorological work, experiments with navigation and instruments, the development of ground communications, and so forth are concerned, these are equally of importance to militant and civil aviation. Therefore such work may very well be done rather better in the R.A.F. than out of it.

Personally one is all against civilian officials in aviation or any other business. If certain development work has to be done by Government servants, either purely technical work such as experimenting with machines and engines and instruments or other work such as the development of air routes (e.g., the Baghdad line), let it be done by the R.A.F. or by private enterprise, but not by civilian officials. With some notable exceptions the civilian official is liable to become merely officious. He lacks the pur of Service discipline and the incentive of commercial competition. And if it is noted, a Civil Servant is a person who differs materially from a civilian official.

One commends these points to the consideration of those concerned and proposes hereafter to deal with other matters affecting the progress of British Aviation in 1922.—C. G. G.

(To be continued.)



## THE REVIEW OF THE YEAR 1921.

## OCTOBER.

**SERVICE AERONAUTICS.**—On Oct. 5th it was recorded that the airship stations at Kingsnorth and Howden had been taken over by the Admiralty.

On Oct. 6th Air Commodore Brooke-Popham delivered a lecture on the Desert Route to the East which for the first time made clear the conditions of operation on that line. It was notified on Oct. 6th that the R.A.F. station at Leuchars, Fife, had been reorganised and would be used for the purpose of co-operating with the Atlantic Fleet.

On Oct. 12th various high officials of the Air Ministry and the R.A.F. visited Northolt to witness a demonstration of the Alula Wing in its relation to Service aircraft. Considerable attention was attracted to it in the public Press, but nothing convincing was shown at the demonstration.

On Oct. 16th THE AEROPLANE hazarded the opinion that Sir John Salmond would be appointed to command in Iraq and Sir Edward Ellington to Egypt. These appointments were later confirmed.

It was noted on Oct. 19th that the R.A.F. in India was being reorganised and also that a special detached flight of the R.A.F. had been posted to Aden.

It was also noted on Oct. 19th that the Admiralty was asking for wireless ratings R.N. to volunteer for aircraft work, thus narrowing down the work of the R.A.F. co-operating with the Navy to the mere supply of aerial chauffeurs.

On Oct. 26th it was notified that Air Vice-Marshal J. F. A. Higgins, Grp/Capt. J. A. Chamier and F/Lts A. R. Arnold and R. Gambier Parry would represent the Air Ministry at the Washington Conference.

On Oct. 26th it was definitely announced that Iraq was to be an independent command of the R.A.F. separate from the Middle East Area.

**CIVIL AVIATION.**—On Oct. 1st the Instone Air Line and the Messageries Aériennes began their Winter time-table, their machines leaving at midday instead of at 10.00 hours.

On Oct. 5th a full description and drawings of the new D.H.29 cantilever monoplane were published.

Also on Oct. 5th an appeal was made in this paper by Mr. G. M. Randall asking for experimenters with gliders to get in touch with him.

It was noted on Oct. 5th that Mr. O. P. Jones of the Berkshire Aviation Tours had during the previous week carried his 10,000th passenger, thus surpassing all "joy-riding" records for individual pilots.

On Oct. 5th it was noted that the mooring mast at Croydon, which had been set up in the hopes of experimental airship lines coming into being, was in process of being dismantled.

The claim of the A.B.C. Engine Company for £2,000,000 royalties on engines ordered by the Air Ministry but never used by anybody came before Mr. Justice Sargent and the Commission on Awards to Inventors on Oct. 5th. It will be remembered that the moving spirit in the A.B.C. engine was Sir Samuel Waring, Bart., who won his spurs in the Great War and obtained his baronetcy in connection with aviation, and is also concerned in the B.A.T. Co., the British Nieuport Co., the Alliance Aircraft Co., and Ruffey, Arnell and Beaumann Ltd.

On Oct. 12th scale drawings of the new design for the Handasyde commercial cantilever monoplane were published.

On Oct. 19th a full description was published of the soaring competition in the Rhön Mountains.

It was also noted on Oct. 19th that a number of British aeroplanes were being sent by air to Spain to participate in the war in Morocco.

On Oct. 20th Mr. McIntosh made a notable flight from Paris to Croydon, finding the aerodrome in thick fog and landing safely thereon with the aid of the wireless telephone.

THE AEROPLANE of Oct. 26th contained a condensed account of the lecture delivered by Mr. Griffith Brewer to the Royal Aeronautical Society on Oct. 20th, in which he made direct charges of fraud against Mr. Glenn Curtiss, the famous American designer-constructor, Dr. Zahn and Mr. Manley of the Smithsonian Institute. The article in THE AEROPLANE dealt somewhat fully with the fallacies in Mr. Brewer's charges.

On Oct. 21st the Handley Page W.8, which had long been waiting at Croydon, flew to Paris in 2 hours 2 minutes. After a few voyages in each direction the W.8 began to experience trouble with its wing structure much as it had done on Sept. 20th, 1920, when at the Air Ministry competition at Martlesham Heath. It was therefore delayed in Paris while repairs were done to it and it finally returned to England early in December.

On Oct. 28th a somewhat notable debate took place in the

House of Lords on Civil Aviation. The Lords Montagu, Gorell, Newton and Numburhholme were the chief debaters.

**OVERSEAS DOMINIONS.**—On Oct. 6th it was recorded that S/Ldr. L. S. Breadner, D.S.C., had been appointed Controller of Civil Aviation in Canada, and that Wing/Cdr. J. S. Scott had been appointed to command the Canadian Air Force.

**FOREIGN AVIATION.**—On Oct. 1st there took place the first contest for the Deutsch Cup, which had been put up by the family of the late M. H. Deutsch de la Meurthe to replace the Gordon-Bennett Cup, which had been won outright by France the previous year. The Cup was won by M. Kirch on a Nieuport "Sesquiplan." His time for the 300 kilometres was 1 hr. 4 mins. 39.1-5 secs., as against 1 hr. 6 mins. 17.1-5 secs. the previous year.

On Oct. 11th M. Bajac on a Potez biplane left Paris to inaugurate the new line direct from Paris to Constantinople. The line is not yet in operation.

On Oct. 13th the new air line from Sevilla, in Spain, to Larache (El Araish) in Morocco was opened by Mr. Hatchett on a D.H.10, Siddeley "Puma" engine. Mr. Alan Cobham, who had brought Mr. Hatchett out on a similar machine, took part in the aerial display during the opening ceremony, when the machines were blessed by high ecclesiasts.

On Oct. 22nd the ex-Empress Karl of Austria, *de jure* King of Hungary, accompanied by the ex-Empress Zita, left from Switzerland in a German aeroplane to Oedenburg in Hungary in a gallant effort to raise troops and recapture the kingdom of which he had been wrongfully dispossessed. Unfortunately his sporting effort failed, as he was unwilling to compel the troops who supported him to fight against their fellow-countrymen who disloyally opposed them.

On Oct. 26th permission was given by His Majesty that the French Legion of Honour might be worn by Sir Henry White Smith and the Belgian Order of the Crown by Mr. F. Handley Page.

On Oct. 26th, 27th and 28th a Conference of the Fédération Aéronautique Internationale was held at Madrid. China, Chili, and Finland were elected members of the Fédération and Austria was reinstated, being thus the first of the Central Powers to rejoin the Fédération. It had been proposed to reinstate Germany also but French feeling was so strong that the British and Spanish representatives thought it unwise to press the point.

## NOVEMBER.

**SERVICE AERONAUTICS.**—On Nov. 2nd an article in THE AEROPLANE set forth the great opportunity afforded to the R.A.F. by the decision to give control of Iraq to the Air Force. It was also definitely announced in that issue that Sir Geoffrey Salmond is to be in charge of Supply, Equipment and Research, that Sir Edward Ellington is to take command in Egypt, that Sir John Salmond is to command in Iraq and that Air Vice-Marshal J. F. A. Higgins is to command the Indian area R.A.F., when the re-organisation takes place in 1922.

On the same date it was reported that the Admiralty intended to budget for airships in the next Navy Estimates.

Also it was noted that the Admiralty intended to make aircraft observers a specialised branch of the Navy, similar to gunnery, torpedoes, navigation and so forth. Commanders and Lieut-Commanders R.N. were specially asked to volunteer for this new branch.

A list of awards and mentions in despatches for services in Mesopotamia was published on Nov. 2nd.

It was announced on Nov. 2nd that Sir James Stevenson, the financial member of the Air Council, had resigned.

On Nov. 9th the appointment of Air Commodore Brooke-Popham to be Commandant of the R.A.F. Staff College, Andover, was noted.

On the same date the first notification appeared of a demand by a certain firm of bankers for refund of gratuity overpaid by the said bankers to certain officers.

On Nov. 14th Air Marshal Sir Hugh Trenchard delivered a lecture to the Scottish Branch of the Royal Aeronautical Society in which he set forth something of the future of the R.A.F. His statements produced a curiously ill-informed and misguided attack by the aeronautical correspondent of the Times.

On Nov. 30th an article was published on the Washington Conference and its effect on the R.A.F. Attention was particularly drawn to Naval and Military intrigues against the integrity of the Air Force.

**CIVIL AVIATION.**—The Supermarine "Seal," an amphibian flying boat (Napier engine), was described and illustrated on Nov. 2nd.

The Manchester Aviation Co. Ltd. was registered on Nov. 2nd.

On Nov. 2nd it was noted that Mr. R. Wright, of Nasmyth, Wilson and Co., had bought several D.H.9s for use in Roumania and that Mr. Perry, who had piloted Mr. Wright to Roumania and back some months before, had been appointed to manage these machines.

The first mention of the official "approval" of the two new air lines, one to Paris under the control of Col. Searle and one to Brussels under Air Routes Ltd., was made in this paper on Nov. 2nd.

On Nov. 6th the first Special British Aircraft Constructors' Issue of THE AEROPLANE was issued. It contained a description of British aircraft constructing firms, these descriptions being published in English, French and Spanish, and was the first newspaper effort made in this country to approach foreign buyers of aircraft adequately.

It was noted that the week ending Nov. 6th was the worst of the year since the resumption of air line work in March. Owing to continued fog two days were entirely blank and only 43 machines crossed the Channel in the week with 112 passengers. In the corresponding week a year before 64 machines had crossed the Channel with 128 passengers.

On Nov. 16th the Second Special British Aircraft Constructors' Issue of THE AEROPLANE containing a review of the British aero engines, accessories and material, also in three languages. These tri-lingual issues of THE AEROPLANE produced gratifying compliments from numerous readers in every part of the World. Although they were the first effort of the kind to promote British Trade abroad, apparently the only people who did not think it worth while to compliment the producers were the British manufacturers for whose benefit they were produced.

The first report of the Paris Aero Show appeared in THE AEROPLANE on Nov. 16th.

The first illustration of the Handley Page cantilever monoplane with slotted wings also appeared on Nov. 16th.

On Nov. 17th Col. Searle lectured before the Royal Aeronautical Society and British Aircraft Constructors on Civil Aviation. Unfortunately few of the aircraft constructors themselves who would have profited most by the lecture took the trouble to attend. Probably they already knew Col. Searle's opinion of their intelligence.

On Nov. 23rd Mr. L. R. Tat-Cox, the well-known test pilot, proposed in THE AEROPLANE the formation of a National Institute of Pilots in order not merely to maintain the rate of pay for pilots but also to establish the profession of pilot aviator on a properly dignified basis.

It was noted on Nov. 23rd that certain firms proposed to institute regulation uniforms for civil aviators in their employ.

On Nov. 30th it was noted in THE AEROPLANE that Vickers Ltd. had received orders for the "Viking" amphibian from France and Holland and that the commercial "Vimy" was to be copied in France by the Ateliers des Merveaux.

FOREIGN AERONAUTICS.—On Nov. 3rd the race for the Pulitzer Trophy was flown at Onalua over a 150-mile course. It was won by a Curtiss "Navv-plane" with a speed of 176.0 m.p.h., beating Mr. Kirch's 173.1 m.p.h. on a Nieuport in the Deutsch Cup Race.

It was recorded on Nov. 6th that a U.S. Navy seaplane had been launched from a catapult at the Philadelphia Navy Yard on Oct. 31st, and that so far from being a novelty a No. 9 type Fairey float biplane had been launched from a catapult from H.M.S. *Slinger* during the War at the Isle of Grain.

In the issue of Nov. 6th it was recorded that Major Kingsley of the River Plate Aviation Company had made two notable tours for advertising purposes, one of 1,300 miles, including the Argentine, Uruguay and Brazil, and the second of 1,500 miles, including Uruguay, Paraguay and Brazil, both tours being done on a D.H.9a (Rolls-Royce engine).

It was noted on Nov. 9th that the Congo Aerial Mail Service was in operation.

On Nov. 16th the Berkshire Aviation Co. Ltd., being located at Birmingham, announced its intention of running air taxi services with Birmingham as a centre.

On Nov. 30th it was noted that airship developments were on foot in France, and that a Spanish-German airship firm was about to start operations with a view to running an airship from Spain to the Argentine via Brazil.

The only well-informed article which has appeared during the past year on aviation in Russia appeared in THE AEROPLANE on Nov. 30th.

#### DECEMBER.

SERVICE AERONAUTICS.—On Dec. 5th the Royal Aircraft Establishment at Farnborough began a series of tests of fire-proof and crash-proof tanks for Service and Civil aircraft, the judges being senior officers of the Technical Department, Air Ministry.

On Dec. 6th occurred the first hearing of a claim by Ruffey, Arnell and Beaumann Limited for damages against the Air Ministry for cancellation of the contract made early in the

War by the War Office to keep that firm's flying school supplied with pupils.

On Dec. 7th there was published a severe criticism on the speech made at Amiens by General Sir Henry Wilson, Chief of the Imperial General Staff, in which he was reported to have said that the development of the aeroplane movement seemed a development of a movement for killing women and children.

On Dec. 8th an interesting and amusing experiment was tried at Farnborough, when a Sopwith "Camel" was released (out of control) from a kite balloon and a parachute with a dummy was automatically released from the "Camel," the idea being to see whether a man could escape by parachute from an aeroplane which was not under control. The result was the wrecking of two motor-winch lorries, the failure of the parachute and comparatively slight damage to the aeroplane.

On Dec. 7th and 8th the Boxing Tournament for R.A.F. novices for the Wakefield Trophies took place at Halton.

On Dec. 9th the Air Ministry announced the resignation of Vice-Admiral Sir C. F. Lambert, Director of Personnel.

On Dec. 10th the verdict was given on the claim of Ruffey, Arnell and Beaumann Ltd. The firm was awarded £250 damages for cancellation of contract and ordered to pay half its own costs. On a counter claim for goods supplied the Government was given a verdict for £1,227. It will be recalled that Ruffey, Arnell and Beaumann Ltd. is controlled by the Alliance Aircraft Co. Ltd., the moving spirit of which is Sir Samuel Waring, Bart., who won his spurs in the Great War and obtained his Baroncy in connection with aviation. It will be recalled that this gentleman is also interested in the B.A.T. Co., the British Nieuport Co. and the A.B.C. engine.

On Dec. 21st THE AEROPLANE published for the first time accurate information concerning experiments with real aerial torpedoes which were made during the War and abandoned as useless.

On Dec. 28th there appeared in THE AEROPLANE a leader strongly advocating the formation of a Ministry of Defence.

On Dec. 28th the results of the Naval Examinations for entrance to the R.A.F. Cadet College at Cranwell were published. Mr. N. Young, who was at the top of the list, obtained 12,232 marks, which was equivalent to obtaining second place in Woolwich.

CIVIL AVIATION.—Early in December the Air Ministry announced that the second Air Conference would take place at the Guildhall on April 7th and 8th.

On Dec. 1st strong comments appeared in THE AEROPLANE on the failure of the London-Paris air mail service. Also the information was published that capital was likely to be available for the development of imperial air routes.

On Dec. 10th the Gloucestershire Aircraft Company's "Mars I," commonly known as the "Bamel" (Napier engine), piloted by Mr. Herbert James, put up a British speed record of 106.6 miles per hour, a figure which beat the official World's record held by a French machine, though in fact a more recent French record of 205 m.p.h. had already been made but not officially passed by the Internationale Aéronautique Federation. In one run out of four the "Bamel" covered a kilometre at 112 m.p.h., thus proving itself to be the fastest machine in the World.

On Dec. 12th the first Annual Dinner of the staff and employees of the Croydon Aerodrome and of the Civil Aviation firms operating thereat took place, with Major Greer, Civil Air Traffic Officer, in the Chair.

On Dec. 14th it was noted that Mrs. Oliver Atkey, now the only British aviatrix, had been flying well at Croydon during the week.

On Dec. 21st it was recorded that the Instone Air Line Ltd. had been registered.

On Dec. 21st there were published a description and illustration of the latest De Havilland product, the D.H.34, a biplane designed to carry ten passengers and pilot, with a Napier "Lion" engine.

OVERSEAS AVIATION.—On Dec. 5th there took place the first flight on a coastal line from Perth to Geraldton and Derby, West Australia, which had been organised by Major Brearley. Unfortunately this flight ended in a fatal accident.

FOREIGN AVIATION.—It was noted on Dec. 7th that the leading French aviation paper, *L'Air*, had taken over the old-established French science journal, *La Technique Aéronautique*.

On Dec. 23rd two French aviators completed a voyage from Paris to Constantinople and back which began on Oct. 10th. This was by way of opening up what is intended to be a regular air line between Paris and Constantinople. The actual flying time for the return journey was 35 hours.

On Dec. 30th and 31st Messrs. Ed. Stinson and Lloyd Berntson in America on a Junkers monoplane (so-called John Larsen) flew without a stop for 26 hr. 10 min. 50 sec., thus beating the existing World's record by fully two hours.



## R.A.F. INTELLIGENCE.

From the *London Gazette*, Jan. 20th.—O/O. H. Smith, D.F.C., is removed from the R.A.F., Jan. 21st.

## R.A.F. SPORTS AND PASTIMES.

## R.A.F. versus Blackheath.

R.A.F. v. Blackheath.—Playing at Blackheath on Jan. 19th the R.A.F. beat Blackheath by 3 goals and 2 tries (21 points) to 1 goal and 1 try (8 points). The R.A.F. have built up a fine side. The scrum pack well down, break up quickly, and use their feet in the loose. F/Lt. Maxwell played a particularly good game scoring one try and kicking 3 goals. F/Lt. Brown worked the scrum well and F/O. J. I. T. Jones (stand-off half) opened up the game again and again. Beyond an occasional tendency to crowd their wings, the three-quarter line never made a mistake, playing fast and accurately throughout the game. F/O. Storrs started the scoring with a fine run from an opening by J. Jones and W. Jones. J. Jones scored next from some short passing.

In the second half an extraordinarily fine rush resulted in Maxwell crossing over. Blackheath then rallied but the R.A.F. defence was too strong for them and although they scored a try from an Air Force pass, which went astray, they were marked down and smothered with a speed and efficiency which must have astonished them. They crossed again later, however, from a forward rush. The R.A.F. then got down to it again and F/Lt. Bryson went through in a zig-zag run from beyond "The Club's" 25 line. Maxwell converting. The final try was scored by F/Lt. Simpson from a line out. The R.A.F. team was as follows:—F/O. J. M. McAleery, back; Cdt. F. B. Forster, F/Lt. O. C. Bryson, F/O. W. Jones and F/O. H. H. Storrs, three-quarter backs; F/Lt. M. H. K. Brown and F/O. J. I. T. Jones, half-backs; F/Lt. R. H. C. Usher, F/Lt. S. P. Simpson, F/Lt. G. H. H. Maxwell, F/O. T. L. Lowe, S/Ldr. W. C. Hicks, F/Lt. E. F. Turner, F/O. J. E. L. Drabble, and Sgt. Smith, forwards.

## No. 4 F.T.S. Abu Sueir.

Festivities on a very extensive plan had been arranged for the personnel of the School, but circumstances necessitated that work should be carried out on Christmas Day as usual, and some items had to be abandoned and others curtailed considerably.

A concert took place on Christmas Eve at 20.00 hours and F/O. Denny helped a very enjoyable time by conducting the newly formed band. His screamingly funny capers during the jazz numbers convulsed the audience. He also contributed comic songs, ably assisted by F/O. Poole. Cpl. Kennet, Cpl. Bance, ACs Lambert and Lawrence the "Damproof" Comedians proved their ability as patter comedians. F/O. Macdonough sang and monologued. Other musical and comic items were contributed by F/Sjt. Hipwell, ACs. Bardley, Heap and Parker. F/O. Poole presided at the piano. The concert closed with the singing of "Auld Lang Syne" and the National Anthem.

The Married Quarters were entertained later by Carol Singers, who were sometimes slightly out of tune (probably owing to the dampness of the night air).

On Christmas Day the men sat down to a really good Christ-

mas Dinner and drank a very hearty toast to the Commanding Officer and Officers of the Station. The N.C.O.s, assisted by the Flight Commanders, acted as waiters for the dinner. F/O. Lydford proved a very able dispenser of the medicine supplied in bottles by the Crown Brewery of Egypt. The Messing Officer and Entertainment Committee earned the thanks of the men for the really good Christmas fare provided by them.

The programme for Boxing Day had to be cancelled owing to the present state of unrest existing in Egypt.

On Christmas evening the married Officers' and N.C.O.s' wives and children were entertained by Mrs. Cruikshank to a tea and Christmas Tree party and each child was the lucky recipient of several gifts from Father Christmas, who arrived through the window (there being no chimneys in this part of the land of sand and sunshine) and departed the same way. The children had a really good time and joined in the games with the ladies with great enjoyment. Mrs. Cruikshank was a delightful hostess and fully deserved the thanks accorded her by the married families.

To sum all things up the Christmas was spent in a very enjoyable manner by all ranks despite the circumstances which caused the curtailment of the festivities.

Owing to the situation of this Unit at Abu Sueir fixtures with outside Units are scarce. The Palestine Group Flight Competition for both Football and Hockey begin in January. The Unit is very keen on winning the R.A.F. Cup and the teams are training hard.

Recent results are as follows:—

SOCCER.—24/9/21, v. 208 Squadron, (away), lost 2—3; 12/10/21, v. Main Supply Depot, Kantara, (a), won 1—0; 15/10/21, v. 1st East Surrey Regt., Ismailia, (home), won 1—0; 16/10/21, v. 208 Squadron, (h), won 2—0; 27/10/21, v. Main Supply Depot, Kantara, (h), won 4—0; 2/11/21, v. Engine Repair Depot, Abbassia, (a), lost 1—2; 10/11/21, v. East Surrey Regt., Ismailia, (a), won 3—2; 19/11/21, v. 208 Squadron, (a), draw 1—1 (rain stopped play).

A match was played on Nov. 21st between Officers and N.C.O.s, resulting in a win for the Officers after a very hard game by 2 goals to one. A return match is to be played in the near future when the N.C.O.s. hope to have their revenge.

F/O. Blackwell at back, F/O. Price at centre-half, F/O. Broadberry at centre, and F/O. Islip were the outstanding players for the officers.

F/Sjt. Eltringham at outside-left played a good game, although repeatedly bowled over, came up smiling, and following a good run and centre enabled Sgt. McPhail at centre to score.

F/Sjt. Smith after his first mistake in goal which resulted in a goal against the N.C.O.s, played very well. Cpl. Kerr at back, Sgt. Broad at half, Sgt. McPhail at centre and Cpl. Thompson inside-left played very well.

HOCKEY.—15/10/21, v. 208 Squadron, (a.), lost 4—1; 2/11/21, v. 72 Punjabis, (h.), lost 5—3; 9/11/21, v. East Surrey Regt. (h.), lost 2—1; 19/11/21, v. East Surrey Regt., (a.), lost 2—0.

(Continued on page 71.)



**A REMINISCENCE OF A MINOR WAR.**—The accompanying photograph, kindly sent by a former officer of 55 Squadron, illustrates the welcome home given to the famous dog "Roger" by his original owners in 100 Squadron, R.A.F. It will be remembered that during the last few months of the war, besides carrying on war against the Germans, 100 Squadron and 55 Squadron had a private war over the ownership of Roger, who was finally abducted by 55 and kept by them until he was lost on the railway when the Squadron was leaving the French Eastern frontier after the war. The photograph will doubtless interest various members of 55 and 100.



# 212 M.P.H

## *The Napier again!*

*Extract from the "Aeroplane," 21.12.21.*

### *The fastest Aeroplane in the World.*

For the first time in history this Country has produced the fastest Aeroplane in the World. On Monday morning, Dec. 19, the Gloucestershire Aircraft Co.'s "Mars I," with her **NAPIER "Lion"** engine, piloted by Mr. Herbert James over the Official R.A.F. Test Course at Martlesham Heath, covered a straight kilometre at 212 miles per hour, and in four runs (two in each direction) put up an average speed of 196.5 miles per hour.

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# AERONAUTICAL ENGINEERING

SUPPLEMENT TO "THE AEROPLANE"

INCORPORATING AIRCRAFT ENGINEERING, AERODYNAMICS, AIRCRAFT FINANCE AND COMMERCIAL AERONAUTICS AND MATTERS PERTAINING TO THE AERONAUTICAL ENGINEER AND THE AIRCRAFT TRADER.

## THE WEEKLY COMMENTARY.

A paper by Brig.-Gen. R. K. Bagnall-Wild on Engine Installations, read before the Royal Aeronautical Society, is reported below. There can be no doubt as to the practical importance of the subjects with which it deals, or with the author's competence to deal with the subject. His views are commended to the Aircraft Industry for study.

At the same time, after having read this paper and that by Wing Commander Beatty a fortnight before on passenger installation one may be excused for feeling that all that now remains for the aeroplane designer to do is

to discover how to make an aeroplane which will carry the requisites of a sound engine installation and comfortable passenger accommodation and still have some surplus lift for the paying load itself.

Official or even semi-official pressure towards the provision of such requirements as are called for in these two papers will be of very great value if they have the effect of driving designers to the making of very greatly improved aeroplanes. But there is unfortunately a certain risk that they will crystallise into hard and fast regulations, applicable only to existing types of aircraft, and so hamper the development of the aeroplane itself.

## ENGINE INSTALLATION.

On Thursday, Jan. 10th, Brigadier-General R. K. Bagnall-Wild read a paper on "Engine Installation" before the Royal Aeronautical Society. The author's present position as Director of Research and his long experience at the head of the A.I.D. suffice to give to the paper a very considerable importance, for his views on how engines should be installed are necessarily to be taken into account by all British aeroplane designers. Beyond this very pertinent aspect there is the fact that General Bagnall-Wild has long shown himself to be an eminently sound judge on practical technical questions, and his opinions on such a subject are of importance entirely apart from considerations of his official position.

### THE PAPER.

General BAGNALL-WILD opened by stating definitely that installation has shown little progress when compared to the development either of the aeroplane structure or of the aero engine. Failure in some part of the installation is the most prolific cause of forced landing, and statistics show that of landings caused by engine failure seven out of eight are due to some trivial breakdown in the installation and not to any defect in the engine itself.

Quite apart from reliability proper development of installation design should provide for considerable economy both as regards upkeep and repair of the installation and from its effect on the ease—and therefore cheapness—of removal of the engine itself for overhaul.

### THE RETARDING CAUSES.

The author suggests that the lack of development of installations is due, firstly to the utter unreliability of early engines themselves, which left no incentive to take trouble over the installation, and secondly to the fact that during the War new types of aeroplanes were usually ready for their engines before the engines for which they were designed were ready for the machines, and consequently machines usually had to be fitted with types of engine other than those provided for. Hence compromise installations.

A third factor has been lack of co-operation and understanding between aeroplane and engine designers, rendered more complete because almost without exception the two designers were members of separate firms.

At present installations are improving, thanks to the advent of civil aircraft and the commercial necessity for reliability and economy.

### THE REQUIRED CHARACTERISTICS.

The desiderata of a sound engine installation were—

- (a) Reliability and simplicity of arrangement of petrol, water and oil systems, to give maximum engine efficiency.
- (b) Every possible precaution against fire.
- (c) A high factor of safety in engine mounting and in all its accessories, both as to initial soundness and to secure long service of the items.
- (d) Ready accessibility of the whole engine and installation, particularly for parts such as carburettors, magnetos, petrol pumps, cocks and filters, and controls which need frequent inspection.

(e) Arrangement such as to require the minimum of disconnection and displacement for the removal of the engine. It should be possible to remove an engine and replace it with a serviceable unit in not more than two hours. Gen. Bagnall-Wild looks forward to the replacing of engine units at intermediate point, on long distance flights, much as locomotives are changed on long distance trains.

(f) Simple and reliable engine starting arrangements.

### PETROL SYSTEMS.

Despite certain difficulties which have hitherto been considered too great, the gravity system is considered ideal. The author wonders if designers appreciate the simplicity and efficiency of the gravity system, and whether a satisfactory system would not be rapidly evolved if gravity feed were specified as a condition of acceptance of aircraft. It will probably be necessary for civil aircraft to insist on gravity feed—even at the expense of aerodynamic efficiency.

The alternatives are (1) air pressure systems, (2) petrol pump systems, and (3) a vacuum lift apparatus. Air pressure systems were abandoned in the War for Service craft owing to their vulnerability. Petrol pumps are still unreliable. Both systems 2 and 3 call for auxiliary tanks, overflow arrangements and similar complexities.

### PETROL PIPES.

Petrol pipe lines have probably been a greater source of trouble from the maintenance point of view than any other part of aircraft. Rubber petrol joints are an acknowledged source both of trouble and expense. It is only quite recently that alternatives to their use have been introduced.

Breakages of petrol pipes normally occur at or near a point of rigid attachment. The rigidity of the attachment is part cause of the failure, but it is aided by the fact that brazed joints at these points weaken the tube. One new method involves joints wherein the tube is expanded into a collar which is one member of a union, and thus avoids brazing. This type has stood up well during tests.

The second method is the use of Blaisdell Petro-flex instead of the rubber. This type is also promising.

### ENGINE MOUNTINGS.

These must have a high factor of safety and be so rigid that distortion likely unduly to stress the crankcase is avoided. The whole mounting should preferably be in steel, which avoids shrinkage troubles and reduces the fire risk.

The Rolls-Royce "Condor" is fitted with spherical bushes in the engine feet which take the bearer tubes, and only the front bushes are fastened to the bearers. Thus distortion of the tube-bearers, and difference in expansion between crankcase and bearers do not stress the crankcase.

### ENGINE CONTROLS.

The extraordinary lack of uniformity in engine controls on different types of aircraft is criticised. Some are well designed in detail—most are primitive in the extreme. So far the positive rod type of control is most satisfactory, particularly if bearings, brackets and levers are well designed and made. Cable controls are convenient to install, but are un-



satisfactory from stretching of cables and fraying, sometimes in inaccessible and invisible places. Clear marking of controls, both as to purpose and direction of operation is desirable, and the shape of levers should be distinctive so that they may be recognised by feel through flying gloves.

#### OIL SYSTEMS AND RADIATORS

Little is said about oil systems or radiators. It is suggested that an oil temperature recorder should be fitted in the first machine of a new type so that correctness of oil temperature may be checked on tests. Good average results are generally obtained with radiators, probably because unnecessarily large radiators are fitted and shutters used to control water temperature.

#### FIRE PREVENTION.

Safeguards against fire risks have been dealt with by the Fire Prevention committee. Their recommendations have been published and endorsed by the Air Ministry, and are now compulsory on all new Service aircraft. These recommendations include:—

(i) A fire-proof bulkhead of sheet metal lined with asbestos between engine and the rest of the aircraft, with close-fitting bushes for controls, etc.

(ii) Engine mounting and structure in the immediate vicinity to be of fire-resisting material;

(iii) No rubber or soft-soldered joints in petrol pipes on the engine side of the bulkhead.

(iv) All carburettor intakes taken outboard and exposed to the air stream.

(v) All exhaust manifolds taken outboard and away from intakes.

(vi) Petrol and oil to be carried as far from the engine as possible.

(vii) Induction systems to be designed, and tested at pressures considerably greater than those to which they are likely to be subjected by irregular running.

#### ACCESSIBILITY.

Parts of installations in inaccessible position will require extra supervision to ensure that they are looked after, and are likely to be well maintained. Yet the inaccessibility not only of parts but of the whole engine is often astonishing, particularly in seaplanes. Proper arrangements for standing round an engine should be made, particularly in seaplanes, where attention to engines is often risky if the machines are afloat. Where it is necessary to walk on planes to get at an engine an ample surface should be available to stand upon. Small patches fit for this are of little use.

Proper arrangements for taking engines out of the machine are necessary. With engines between planes it is impossible to lift. Arrangement of the bearers so that an extension supported from the ground at its outer end could be attached, the engine drawn forward onto the extension and then lifted, might be provided.

#### STARTING.

Propeller swinging as a method of starting is dangerous and rapidly going out of use. Other methods in use are the hand turning gear, operated in conjunction with a starting magnet, electric motor starter, and the motor driven starter—such as the Hucks.

These work, and the Hucks starter is excellent at busy aerodromes. For the future hope is focussed on the auxiliary engine starter consisting of a small auxiliary engine driving a pump, which is connected to the cylinders by a distributor valve. The pump takes explosive mixture from the auxiliary engine carburettor, and raises sufficient pressure to turn over the engine, at the same time filling the cylinders with explosive mixture.

During the reading of the paper a number of very interesting lantern slides bearing on the subject were shown, among them a number of the engine installation of the Bristol "Tramp" triplane, which has four Siddleley "Puma" engines in a central engine room, geared and clutched together so that two airscrews on the wings may be driven. Any engine or pair of engines may be coupled to either airscrew.

#### THE DISCUSSION.

Mr. HANDLEY PAGE agreed that most failures in Civil aviation were engine failures and that co-operation between aeroplane and engine designers should remove many troubles. But during the War, when he was building aeroplanes for Rolls engines and Rolls-Royce were building engines for his aeroplanes, both the aeroplanes and the engines were such secret jobs that he and Rolls-Royce were strictly forbidden to communicate one with another.

The engine was the aircraft designer's bugbear, and a lot could be done by engine designers to simplify the aeroplane designer's task. If engines were built with cylinders below instead of on top, the carburettors could be low enough to make gravity petrol feed possible, and the airscrew could be high enough for ground clearance and still allow the pilot to see over the engine.

The picture shown, of the Bristol multi-engine installation, filled him with trepidation as to the probable cost of main-

tenance. The ideal engine installation he thought would be an air-cooled engine, with the tank over it, and the pilot alongside. This would give short, simple controls.

Capt. WILKINSON said that if the engine was the aeroplane designer's bugbear, the aeroplane was equally the bugbear of the engine designer. If aeroplane designers could be got to agree to standard positions of attachments for engine and for its controls and connections, the engine designers could provide standard installations and take over the aeroplane designer's engine troubles.

General BRANCKER wanted to stir up the engine designers. He thought it was idiotic to fly about with many gallons of water and a complicated cooling system. He was all for air-cooled engines. Far away the best Service engine in the East had been the Raf 4a, which only required jet changing to suit the highest temperature. He agreed with the lecturer's ideal as to changing engines at stages, but the time for change should be ten minutes, not two hours. German installations were, he thought, always ahead of ours in regard to simplicity and robustness, and to-day, he thought, the Pöcker installation in advance of our own. The self-starter was imperative. To-day Service machines were not allowed to fly alone across the desert, because in the event of a landing four men were needed to start an engine. Simplicity and strength were essential in all details.

Group Capt. E. F. BRIGGS mentioned as an example of troubles which could be reduced by co-operation between designers the exhaust manifold, which was often a source of trouble. It would help towards simple petrol systems if engines were fitted with engine-driven petrol pumps.

Major HECKSTALL SMITH said that from the paper it was obvious that there existed statistics as to the causes of accident which he and others concerned in the improvement of aeroplanes had not at their disposal. If all the information in General Bagnall-Wild's possession were generally available the aeroplane designers might be better people.

S/Ldr. MILLY said that in the past the aeroplane designer ascribed all his troubles to the engine, and the engine maker put the blame on the aeroplane. To-day both parties had agreed to put all troubles on the installation. There seemed room for a new profession, that of designing sound installation accessories. He could not agree as to the general inaccessibility of seaplane engines. Many seaplanes were in service with highly accessible engines, and they gave very little trouble. In flying-boats the gravity petrol system presented great difficulties and it was almost invariably necessary to lift petrol. The pressure system worked satisfactorily. One could not drill holes in the bottom of a boat, and the pump system meant long suction connections.

Major WIMPERIS said that the paper was confined to engine installation, but all installations—wires, armament and the like—were sources of difficulty. In connection with fire risks he could not omit to pay a tribute to the memory of S/Ldr. Norman, whose heroic work had done so much in this cause. The suggestion that petrol tanks should be as far from the engine as possible surprised him. What was to happen in a fast-climbing machine?

Capt. BURGOIN said that a hand-turning gear for a 400/500 h.p. engine weighed about 15 lbs., an electric starter motor about 45 lbs. plus the 45 lbs. of battery, and the R.A.E. type of auxiliary engine starter about 45 lbs. plus 5 lbs. extra for each extra engine.

Major BUCHANAN wished to join the general "grouse" about engine builders. In one engine it was practically impossible to get at the carburettor if it were fitted with a nose radiator. Gravity petrol was possible for Civil aircraft, but Service experience was that it was unwise to put all petrol in one tank. Self-sealing tanks may alter this condition. The conditions for radiators were not the same for Service as for Civil requirements. The Service machine had to be able to go straight off the ground and climb at full power in the hottest weather. The Civil machine need not. The fireproof bulkhead was a sound scheme, but on military machines guns, bomb-sights and the like insisted on getting in the way, and reduced the bulkhead to small dimensions.

Lt-Col. MEKYN O'GORMAN (Chairman) said he was delighted to gather that the old water- versus air-cooled controversy seemed to be reviving. He wondered why the author had neglected the possibility of using aluminium petrol lines. The gold-beaters-skin pipe joint was useful, but he thought it was a temporary phase as it was not fireproof. Great danger arose from electric leads near petrol pipes—it was almost certainly the cause of the R.38 disaster, and he thought accumulators in aircraft were, after exhaust pipes, the greatest cause of fire risk.

Brig-Gen. BAGNALL-WILD, in reply, said that he had received much food for thought during the discussion, but there seemed only one question for him to answer. He had not referred to aluminium petrol pipes because he was considering both seaplanes and land machines, and aluminium was objectionable at sea.

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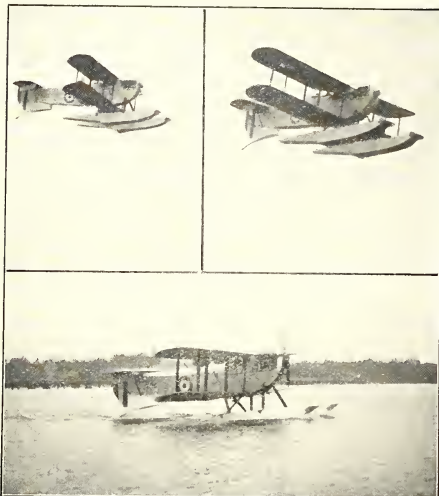
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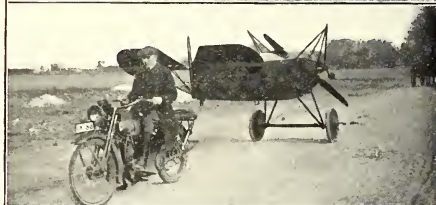
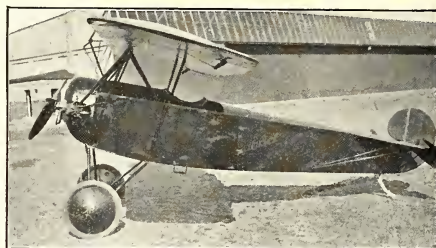
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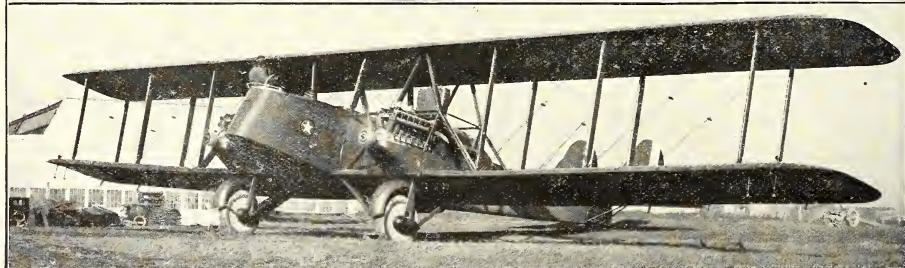
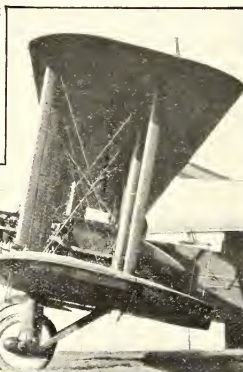


**A NEW FAIREY AMPHIBIAN.**—The photograph above shows a Fairey, generally of the same type as that exhibited at the 1920 Aero Show, fitted with the new "wheel in float" undercarriage. The machine is capable of alighting both on land and water, and there are no moving parts in the undercarriage. The wheel shows as a slight bulge underneath each float.



**A POLISH MONOFLANE.**—The machine illustrated is a little single-seater Sporting Monoplane with a 30 h.p. Haacke 2 cylinder engine, built by the Brothers Gabriel at Bromberg, Poland. The overall span is 5 metres, and the maximum speed 169 km.h.

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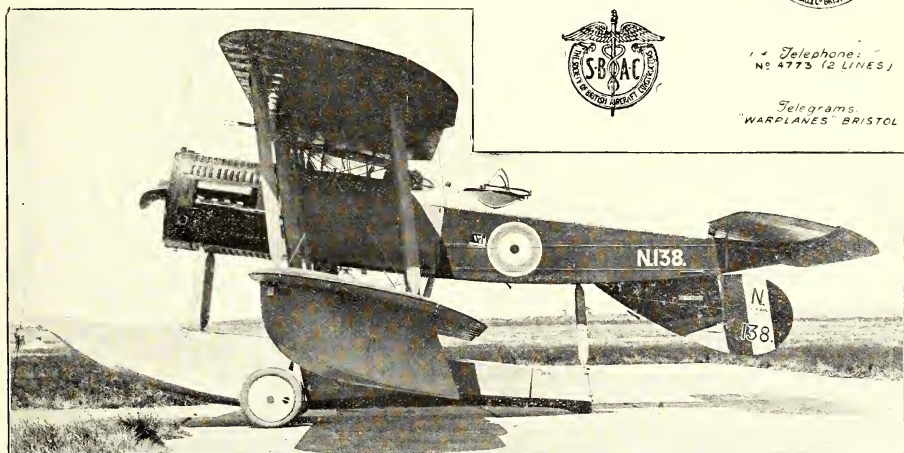
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## ELEMENTARY METEOROLOGY.

With the coming of aviation the science of meteorology has entered upon a new stage. A few years ago meteorology was the province of a few men of science, of a fair number of enthusiastic amateurs—some competent and some far otherwise. There was a Meteorological Office and there were weather forecasts. To some slight extent the operations of the Meteorological Office were of importance to and were acknowledged by the mariner. To the world at large they are equally important in reality but little esteemed.

Aviation has made entirely new demands of the meteorologist. Not only does the pilot desire to know the probable general trend of the weather of the near future over a large district, but he desires information as to the detailed meteorological conditions at a specified time at a specified spot, and experience has shown that the demands of aviators can only be met by a large increase in the number of qualified meteorologists, and by the active participation in meteorological work of those directly interested in aviation.

Consequently there has arisen a demand for instruction in the principles of meteorology on a scale very much wider than has existed heretofore.

To meet this demand there has just been published by H.M. Stationery Office a small introductory manual on meteorology. The book is the work of Mr. W. H. Pick, B.Sc., of the Meteorological Office, and is published by the authority of the Meteorological Committee. It is designed with a special view to the requirements of aviation, though naturally it deals with the whole subject of the laws of meteorology, is written in a clear and simple style, and can confidently be recommended to all who wish to take up a study of this very important subject.

("A Short Course in Elementary Meteorology." By W. H. Pick, B.Sc. Published by His Majesty's Stationery Office, Kingsway, W.2. Price 1s. 6d. net. Post free 1s. 8½d.)

## THE SWISS SOARING FLIGHT COURSE AND COMPETITION.

It was announced in the issue of THE AEROPLANE for Jan. 18th that a soaring flight competition preceded by a course of instruction in the piloting of soaring machines was to be held at Gstaad, Bernese Oberland, in March of this year.

The regulations governing the course and the contest have now been received by the Royal Aero Club, and are given in abstract below.

The locale of both course and contest is the Climatological Station at Gstaad. The course extends from Feb. 15th to March 15th. A pilot who distinguished himself at the Rhône Competitions will act as instructor.

The course is open to anyone possessing a glider, or able to obtain the loan of one from a third party. The Suisse-Centrale Section of the Swiss Aero Club will place such gliders as they have in their possession at the disposal of a limited number of pupils. The Soaring Flight Commission of the section have the sole right to allot the said gliders, and that Commission will have control of the programme and will decide as to the admission as pupils of applicants on the basis of a technical examination. The Commission will also allot space in tents or other shelters to the entering gliders.

The course of instruction is open to pupils of all nationalities.

The contest itself is open only to Swiss nationals, and is to be decided by the total duration of all flights made by each competitor, flights of less than 10 seconds' duration being neglected.

The prizes are:—

The Challenge Cup, presented by the Suisse-Centrale Section. This cup is to be competed for annually and becomes the property of the first pilot to win it twice—not necessarily consecutively: A prize of 500 francs to the winner of the cup in 1922, and a prize of 300 francs for the second longest total duration.

The prizes are awarded to pilots and not to machines.

Application for entrance to the course and to the competition must be sent separately to the President, the Suisse-Centrale Section, M. le Major Isler, at l'Office Aérien Fédéral, Berne, to arrive not later than Jan. 31st.

An entrance fee of 50 francs must be sent at the same time to M. Schieb, Treasurer, the Suisse-Centrale Section, Swiss Aero Club, Glockenthal, Thun.

Applicants for the use of one of the Club's gliders must forward a fee of 125 francs plus 100 francs deposit against damage.

Applicants must express their willingness to submit to all regulations made by the organisers, must describe the machine they propose to use, its ownership, and prove their right to its use if it is not their own.

General arrangement drawings, with dimensions, weights and factors of safety, must be supplied in respect of privately owned machines entered; also details of starting and landing gear, and the name of designer and constructor.

## NOTICES TO GROUND ENGINEERS.

The Air Ministry's official "Notices to Ground Engineers" are all based upon a desire to secure a remedy to defects disclosed in practice in various types of aircraft or engines, and therefore even in countries where their observation is not compulsory they are of great importance to all concerned in the operation of aircraft of the types wherewith the said notices deal.

The following statement as to the quarters from which copies of these notices may be obtained should therefore be of value.

In the British Dominions copies of these notices are obtainable from the Government department controlling civil aviation. In Canada the Air Board has reprinted all the notices and circulates them much as the Air Ministry does in Britain.

In the Colonies and Protectorates copies may be obtained as follows:—

In Southern and in Northern Rhodesia from the Secretary to the Administrator.

In Swaziland, Bechuanaland and Basutoland from the Government Secretary.

In Tanganyika Territory and in Uganda from the Chief Secretary to the Government.

In Kenya, Ceylon, Hong Kong, the Straits Settlements, British Guiana, The Bahamas, Bermuda and Trinidad, from the Colonial Secretary.

In Belgium, Czechoslovakia, Holland, Finland, Greece, Serbia, Norway, Rumania, Sweden, Italy, Poland, Portugal, Switzerland, France, Denmark, China, and the U.S.A. copies may be obtained from the British Embassy in the capital of the said country. In France and the United States enquiries should be addressed to the Air Attaché, at the Embassy.

In countries other than those above mentioned it is temporarily necessary to apply direct to the Secretary, the Air Ministry, London.

## A ZEPPELIN FOR THE UNITED STATES.

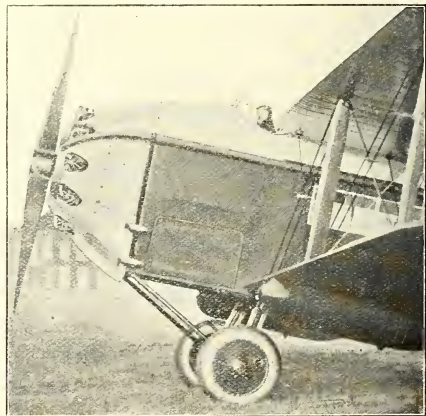
It is stated that the Council of Allied Ambassadors has consented to an airship being built by the Zeppelin Company in Germany for the Government of the United States of America. Work on the vessel is to be begun forthwith.

It is hoped that it will be more satisfactory than British attempts at building airships.

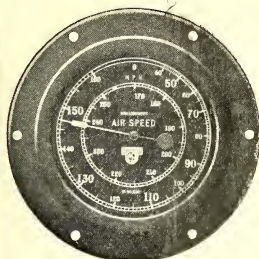
German aeronautical engineers have recently been to the United States studying the air routes between Berlin, New York and Chicago and taking part in conferences with representatives of the United States authorities.

## MIDLAND ENTERPRISE.

So that the Scottish friends and customers of the Midland Motor Cylinder Co. Ltd., Dartmouth Road Foundries, Smethwick, may have the personal attention of a man on the spot, Mr. W. V. Thomson, 4, Jane Street, Blythswood Square, Glasgow, has been appointed to represent the associated interests of this firm and the Birmingham Aluminium Casting Co. Ltd., Cambridge Street Works, Birmingham. Mr. Thomson hopes to take the opportunity of meeting the firm's clientele between now and during the period of the Scottish Show.



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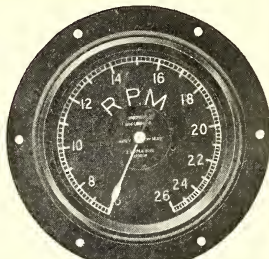
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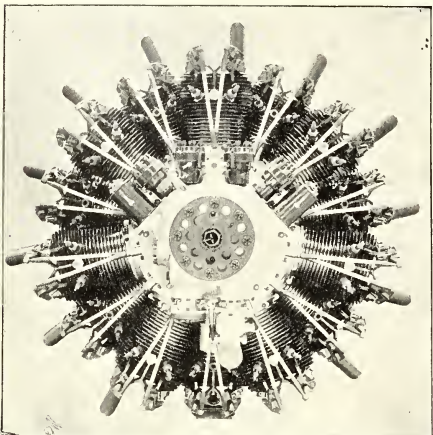
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## Accles & Pollock, Limited,

Makers and manipulators  
of weldless steel tubing,

Oldbury, Birmingham.

(Continued from page 60.)

**Boxing in Baghdad.**

The first of a series of boxing competitions was held by the units of the Iraq Group at Baghdad on Nov. 11th, 1921. This competition was kept entirely for novices who, in spite of the hot Summer they had gone through, and in consequence short training, put up some remarkably good fights.

It was a most pleasing evening not only on account of the excellent fighting but also because of the thoroughly sporting spirit which was shown, both by competitors and spectators. As referee P/Lt. Vincent, though never harsh, kept the competitors hard at it. Those behind the scenes are also to be congratulated for they had the next two in the ring almost before the last two were out of it.

In the flyweights AC.2 Duncan of Aircraft Park came out as winner, beating AC.2 Myers of No. 8 Sqdn. Duncan should be seen again and for a long time, as he shows remarkable promise, having a really good punch and being exceptionally quick with his foot work. It is to be hoped that this airman will closely follow up this the finest of all sports whenever and wherever he can getting all the tuition that may come his way.

In the featherweights AC.2 Hamilton of 55 Sqdn. was winner. Having a quick cover he is rather apt to over use it, but he fights well and keenly; serious indeed, but always with a smile, should he either give or receive a blow.

The lightweight produced the largest number of entries and AC.2 Scott No. 6 Sqdn. had to go all out to fight his way to the finish. None could help being pleased to see him win because of the spirit in which he fought. Being remarkably tall for his weight he has a long pull over his opponent. He has yet a lot to learn, amongst other things that he must put in punishment, though his opponent appears to have had enough. This is not un-sporting, it is boxing.

The light heavyweights, from appearances of the only two competitors, promised well, but failed miserably, AC. Spence of No. 30 Sqdn. winning in the first round, giving his opponent who was receiving weight a nasty 80 seconds. Spence's opponent must learn that of all sports boxing is the one where fitness tells and that if you come into the ring mere flesh instead of muscle flesh you will remain.

The welter weights also produced a large entry and on the whole the best boxing of the evening, Jenkinson of No. 8 Sqdn. working his way to carry off the prize. This boxer has evidently had the importance of foot work well drilled into him, a thing which was rather lacking in most of the other competitors.

At the close of the evening Wing/Cmdr. McNeece kindly presented the prizes in the absence of Grp/Capt. A. E. Borton, C.B., D.S.O., A.F.C., who through illness was unable to be present. We hope to have another boxing evening in early December, this time for all comers, yet from the spirit and standard of boxing shown we expect to see quite a number of novices trying their fists at higher things.—M. H. E.

**Duxford.**

At No. 2 F.T.S. the Association football season was opened with great enthusiasm, inter-section matches taking place two or three nights a week and soon revealing talent sufficient to allow station teams to be selected. The choosing of a first eleven out of so many keen players gave the selection committee a difficult task; the judgment of the committee seems however to be good.

The first eleven, competing in the Cambridge League Division I, have out of three matches played won two and drawn one. Against Ely, whom we beat 1-0, the defence played well.

Against Cambridge Town A, considered a very strong side, changes were made in the inside positions with satisfactory results. The defence played well, but the backs showed a reluctance to cover one another. The halves and forwards combined well, and the latter were always dangerous in front of goal. The issue of the game was never in doubt, the R.A.F. scoring three times without being seriously threatened. Towards the end of the game Cambridge broke away and scored one goal.

Against Chatteris Engineers a draw, the scoring, two all, gave a fair indication of the game. The team gave an impression of better combination and greater confidence in itself.

In the R.A.F. Cup, the first round No. 2 F.T.S. were drawn against I.A.A.D. Henlow, and an exciting game, played on the Duxford ground, resulted in a draw.

The game was replayed at Henlow with the result again a draw, 2-2. The game was played on a dull day with a wind blowing across the ground. At the start Henlow attempted to score with a high dropping shot, which Etherington, the Duxford goalkeeper, managed to clear over the bar. Encouraged by this Duxford worked the ball up the left wing till Hill, from a well-placed pass by Turner, put in a hard

drive which was well saved by the Henlow goalkeeper. After some midfield play there followed a nice in front of the Duxford goal, which resulted in a hard shot from the Henlow centre going through. Half-time found the score Henlow 1, Duxford 0.

Owing to fading light play was resumed at once and Duxford began to press, Hill soon getting an opportunity to put in a lightning shot which the Henlow goalkeeper failed to reach. After a period of give and take play Turner put in a cross shot which looked like being a goal, but the ball was handled by one of the Henlow backs and a penalty was given to Duxford, Watson taking the kick scored. The rest of the game was played in front of the Duxford goal and resulted just before time in the ball being headed into the net, leaving the score two all a draw in the second game.

Henlow subsequently scratched in the replay, leaving Duxford the victors.

**Harlescott.**

ENTERTAINMENTS.—Christmas and the New Year were celebrated in fine style at the M.T. Repair Depot, and the unlucky ones who were left behind were well catered for. A start was made after church parade on Christmas morning, with a football match between the officers and N.C.O.s versus the men. The ground was rather muddy and some of the players inexperienced, and much amusement resulted. At the finish the men ran out easy winners by about four clear goals. Dinner was the next item and was very successful, everybody getting plenty to eat and drink, quite a lot fed perhaps a little too well, and were wrapped in slumber for the remainder of the afternoon. In the evening pictures were shown in the Camp Cinema before quite a big crowd and at the end converted itself into a kind of impromptu concert. On the Boxing Day a Fancy Dress Ball was given and much keenness and enthusiasm resulted. For the remainder of the week pictures, dances and concerts were arranged. F/O. Glyde must be congratulated on the entire programme which went through without a hitch.

SOCCER.—The Depot Football Team are going "great guns" this season and have only lost three matches altogether in the Shrewsbury and Thurday Leagues, which is the best record obtained at the Depot since its formation in 1918. At the time of writing they are fourth in the Shrewsbury League and top in the Thursday League. A team is also entered in the Shropshire Junior Cup and have reached the 4th round; during the three matches already played in this competition they have scored 12 goals without reply. Everybody is wondering whether this form can be maintained throughout.

At the beginning of February we play our first tie in the R.A.F. Cup at Xbridge. This is the first fixture we have had in the Cup this season, thanks to our isolated position, and having got so far "backshee" we are hoping to make a good show.

The Depot League formed of teams within the Depot is quite a success and much enthusiasm is seen at matches. At the present time two teams tie for top position, viz., H.Q. and Leylands, while the police and the Carpenters foot the table.

**Henlow Notes.**

In the various matches played last week the I.A.A.D. teams were in every case the winners. Neither a goal nor a point of any description was registered against the Depot.

Playing away on Saturday our Rugger XV scored an easy win over Bedford Athletic, 8 pts.—0. The margin of points in our favour would have been greater had the ground not been in such an indescribably bad condition.

Playing for the Bedfordshire Senior Cup I.A.A.D. "A" Soccer Team accounted for Trickers Athletic, 4-0, on their ground. There are a tough local proposition and figured prominently in the ties for the Amateur Cup.

"B" team beat Potton Town, 2-0, in the re-play for the County Junior Cup.

On the miniature range, AC. Punction won the Monthly Medal (handicap) last Thursday. Pool shooting the following evening was carried off by AC. Tubbs. An immense entry has been made for the inter-hut team competition for the C.O.'s Cup, which is about to begin.

**Football in Iraq.**

The Overland Cup Tie was played before a large crowd of supporters both civilian, Military, and Air Force, but the game itself was a disappointment, and although extra time was played the final whistle blew with no score.

The replay should have taken place on Nov. 7th, but owing to the heavy rains and the awful condition of the ground in Iraq, the replay did not take place until Dec. 1st, when the Aircraft Park playing good football beat the British Club by a goal to nil and successfully passed into the semi-final.

30 Sqdn. also accounted for Army G.H.Q. after a wretched game by the only goal scored.

The R.A.F. teams are drawn against the A and B teams respectively of the Norfolk Regt., and it should rest with



"Park" to win the Cup for the R.A.F. for the second year in succession.

The Baghdad League matches have been greatly interfered with owing to the weather. The only match of any real importance was played on R.A.F. Group H.Q. ground on Dec. 1st between G.H.Q. R.A.F. and Aircraft Park. A good, clean game which ended in a victory for the Park by 3 goals to 2.

In the first half Carter, the G.H.Q. left-back, accidentally handled in the penalty area, consequently goal No. 1. Five minutes later Goss, the other back, did likewise, and the Park were leading by two penalty goals at half-time. White scored for Group early in the second half. Carter had the misfortune to put through his own goal for the Park's number three, and White again scored for Group. The Park were outplayed in the second half.

Special mention must be made of Mills, the G.H.Q. right-half, who played a magnificent game.

Group played No. 1 Sqdn. on 7/12/21, and won a pleasant game by two goals to one.

### Leuchars.

The Concert Party together with the Orchestra have given several concerts recently. One held in the Camp Cinema on Dec. 12th was better than anything we have seen for a considerable time. F/O. Brown must be congratulated on his performance with his one-stringed fiddle, and F/O. Brewin and Company in the "Telephone" sketch. S/Ldr. Bailey is a great acquisition to the Party as adviser and accompanist.

RUGGER.—The Rugger team have had some first-class games, clean, fast and clever, but in most cases the points have failed to show how clever the games were.

We lost against Howe of life by 6 points to nil, and beat Panmuir by 10 points to nil. Donibristle beat us on their own ground by 9 points to nil, and Rosyth beat us by 20 points to nil.

SOCCER.—The Soccer team has been doing very well. Playing against Balgay we won by 4 goals to nil. We beat Butchers by 1 goal to nil, Dundee Y.M.C.A. by 10-0 and Craib by 6-1.

In the third round of the R.A.F. Cup we lost to Donibristle 3-0.

### No. 5 Squadron, Quetta.

It has been said that wherever the English go they carry their games with them. Quetta, with its three British battalions and No. 5 Sqdn., R.A.F., is no exception. These units are not quite on a Peace basis, for Quetta is situated at a point that commands the Persian-Afghanistan-Baluchistan borders and the trans-border tribes often indulge in a little playful raiding. Sport in Quetta is of a necessity organised internally, for five hundred miles of railway link it up with Karachi and India.

On Oct. 1st, 1921, No. 5 Sqdn. had a Grand Gymkhana on the Quetta aerodrome. There were twenty-four events, including a Ladies' Race, a Dog race, and a Donkey race. An inter-Flight cup was presented to the Flight whose Officers, N.C.O.s, and Airmen gained the most points. For the purposes of this cup the Sqdn. was divided into A, B, C, H.Q.a, H.Q.b, and M.T. Flights. H.Q.b won this pot by double the points gained by any other Flight. The winners won 36 points, while "A" Flight was second with 16 points. The best all round sportsman took the C.O.'s cup; this was Cpl. Kemp of H.Q.b. Of the other team events H.Q.b carried off the Cross-country and the M.T. the Tug-of-War.

Soccer is a very popular game, even though the height of Quetta is 5,000 ft. above sea level, and there are not two blades of grass touching each other in the Cantonment. Out of the last 17 games played with the R.A., Rifle Brigade, King's Royal Rifle Corps and the Devonshire Regt., No. 5 Sqdn. won 10, drew 4, and lost 3. The first round of the Patel Cup was played on Dec. 13th, 1921, resulting in a win for No. 5 against "A" Co., Cameronians, by 3 goals to none.

Inter-Flight Soccer is played as keenly as Sqdn. games. Last year the Challenge Cup was won by M.T. by one point, and this year "C" Flight held it by three points over last year's holders.

Now in December when snow permits the inter-Flight Hockey Cup is causing the medical staff to work overtime. H.Q.b. top the list with four wins out of four games, but with the Trooping season in full swing the result is very uncertain.

The Baluchistan Open Golf Tournament was won by F/O. Kenelm Lister-Kaye, while F/O. Whitefield rode three winners at the Quetta races.

The Leave season is in the winter at Quetta and most of the officers grasp the opportunity of a little big game shooting and migrate to the warmth of the Central Provinces of India.

## THE DE HAVILLAND AIRCRAFT COMPANY

It is very gratifying to note that Mr. A. S. Butler who owns a Bristol Tourer and who put up such a good show in the Aerial Derby, has been appointed a Director of the De Havilland Aircraft Co. Ltd. Mr. Butler's sporting tendencies are well known, and it would not be surprising if in the future the firm took up the building of racing machines for Mr. Butler, when affairs in the commercial and R.A.F. world justify the expense.

Meanwhile he is having a special machine built to be known as the D.H.37. It will be a three-seater with a "Falcon" Rolls-Royce engine and will be an ideal touring machine with a high top-speed. Doubtless Mr. Butler will be seen on this machine in this year's races.

## FOREIGN INTELLIGENCE.

### Chile.

Some activity is noticed in the Republic for the forming of a Naval Flying Service at Las Torpederas, near Valparaíso. Light modern types of flying-boats are already being raised. Las Torpederas is an old naval school not now much used. Large modern hangars will be erected as well as workshops.

### Ecuador.

*El Telegrafo* of Guayaquil, one of the oldest newspapers in the Republic, has purchased a Nieuport biplane with a 130-h.p. Clerget, and has secured the services of the Italian airman, Lieut. Ellia, to undertake the flying for *El Telegrafo*.

The owners of the *El Telegrafo* have shown great enterprise in being the first in the field with a private machine, the which is carrying out some record flying for Ecuador.

Some of the recent flights made are Guayaquil to Cuenca, 160 km., Cuenca to Riobamba, 180 km., Riobamba to Quito, 184 km., Quito to Ibarra, 94 km., Ibarra to Tulcan, 83 km., Tulcan to Pasto, 100 km. In each of the flights made *El Telegrafo* was delivered in record time relatively to the slow mail transport in Ecuador.

Signor Ferruccio Guacciardi, another Italian airman in the Republic, is out to break all previous records for height and distance on a Salomon biplane shortly.—H. G. C.

### MR. M. G. SMILES.

Those who knew the Hendon aerodrome in its palmy days will regret to hear of the death of Mr. M. G. Smiles, who was killed on Jan. 18th through falling out of a window of his house at Stone Grove, Edgware. At the inquest a verdict of suicide while temporarily insane was found.

Before the War Mr. Smiles was associated with Mr. Warren, who was his father-in-law, in the London and Provincial Aviation Company at Hendon and, though not a World-famous aviator, he was quite a skilful pilot and flew consistently well on the little Caudrons used by the school. He was particularly notable in those days for his assiduity in looping, and it was claimed for him that he held at one time the British looping "record" with somewhere between 20 and 25 consecutive loops to his credit.

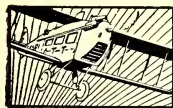
After the outbreak of War he continued to work with the L. and P. Company, and was of great service as an instructor. Thanks to the skill and care of Mr. Warren and Mr. Smiles the L. and P. Company had an enviable reputation for freedom from accident and their machines were always notably airworthy.

When the War Office decided to support the civilian schools the L. and P. firm acquired the aerodrome at Stag Lane which is now the property of the De Havilland Company, and there not only carried on instructional work but built their own machines for the purpose. Later, when the schools were closed, the firm built a large amount of aircraft parts under sub-contract.

At the end of the War the L. and P. Company set out to make a success of Civil Aviation and built some very interesting small machines for the work. These machines were condemned by the technical people at the Air Ministry on the grounds that they were not sufficiently strong, though machines of very similar type had been used for instruction during the War and though these particular machines had been looped and spun and contorted in the air in every possible way by Mr. Smiles and their air-worthiness had been completely proved.

In disgust Messrs. Warren and Smiles shut down the L. and P. Company and Mr. Smiles started a chocolate factory on his own account. Mr. Smiles leaves a widow and two small children, to whom all those who worked and served at Hendon will offer their sincere condolences in their great loss.—C. G. C.





# COMMERCIAL AERONAUTICS

## AND CIVIL AERIAL TRANSPORT.



THE UNITED KINGDOM OF GREAT BRITAIN AND IRELAND.

### CONTINENTAL ARRIVALS AND DEPARTURES.

[The following table of arrivals at and departures from the British Air Ports is compiled on the following system:— First comes the initials of the Air Line; next the type of machine; next the international number of the machine; next the ports of departure and destination; next the times of departure and arrival; next the cargo, whether goods (G) and/or mails (M); next the number of passengers; and finally the name of the pilot and number of mechanics, if any.]

ABBREVIATIONS:—A.D.—Aircraft Disposal Co. B.A.—Berkshire Aviation Co. B.C.—Bristol Aeroplane Co. B.M.—Brompton Motor Co. C.A.—Department of Civil Aviation. D.H.—De Havilland Aircraft Co. G.E.—Compagnie des Grands Express Aeriens. H.P.—Handley Page Transport Ltd. I.L.—Instone Air Line. K.L.—Koninklijke Luchtvaart Maatschappij. L.A.—Leatherhead Aviation Services. M.A.—Messageries Aeriennes. M.W.—Marconi Wireless Telegraph Co. Ltd. P.O.—Privately owned. P.L.—Pettors Ltd. S.F.—Surrey Flying Services. S.N.—Syndicat National pour l'Etude des Transports Aeriens (S.N.E.T.A.).

The London Terminal Aerodrome, Croydon. (Telephone: Croydon 2720.)

#### JANUARY 16th:

I.L., DH8, G-EARO, London-Paris, 12.24-14.40, G.M., 2, Robins & 1.  
G.E., Goliath, F-ADDS, London-Paris, 12.39-15.20, G., 2, Mire & 1.  
A.D., DH9, G-EBBB, London-Brussels, 12.54-14.35, Nil, Nil, Ferry.  
A.D., DH9, G-EBAP, London-Brussels, 12.55-14.39, Nil, Nil, Foot.  
G.E., Goliath, F-GEAO, Paris-London, 11.55-15.15, G., Nil, Favreau & 1.  
M.A., Spad, F-ACMG, Paris-London, 12.35-16.14, Nil, 3, Ferguson.  
M.A., Spad, F-ADAF, Paris-London, 12.40-16.25, G.M., 2, Le Men.

#### JANUARY 17th:

G.R., Goliath, F-GEAD, London-Paris, 12.23-14.45, G., Nil, Favreau & 1.  
M.A., Spad, F-ACMG, London-Paris, 12.39-15.20, G., Nil, Ferguson.  
M.A., Spad, F-ADAF, London-Paris, 12.40-15.40, G.M., 1, Le Men.  
I.L., DH8, G-EAWW, Paris-London, 12.15-16.34, G., Nil, Holmes & 1.  
I.L., DH8, G-EARO, Paris-London, 12.16-16.25, G.M., 2, Robins & 1.

#### JANUARY 18th:

I.L., Vimy, G-EASI, London-Paris, 13.20-St. Ing., G.M., 2, Powell & 1.

#### JANUARY 19th:

M.A., Spad, F-ACME, Paris-London, 14.09-16.25, G.M., 1, Challoux.

### The London Terminal Aerodrome.

The various air lines are carrying on much as usual. The uniforms now have "rank badges" on the sleeves, which is a vast improvement, though one wearer informs me that he thought he had far too much gold braid about him.

The last three days of the week were blank as regards the Continental services.

It is stated that Handley Page Transport are to use this year a species of modified W.8 with Rolls-Royce engines. They have a number of these engines on charge and so naturally it is good economy to fit these engines to a machine designed for them. The stories that the Napier W.8 was "too fast for the London-Paris service" is what the poet called "all my eye." It is more likely that in due course a "Lion" engine H.P. of much greater load-carrying capacity will be produced for air-line work.

On the Saturday of the previous week Mr. MacIntosh was flying above the clouds on an O.400. When he was nearing Le Bourget he tried to get weather reports from that delightful spot but, as is so often the case, was unable to do so. Consequently he decided to come down through the clouds and try landing. This he did and when he got into clear weather he found that the clouds were within a few feet of the ground. He went down on what was ridge and furrow frozen solid, the undercarriage struck a ridge and the machine stood straight on its nose, the pilot's and mechanic's seats being smashed to splinters.

All of which is merely another count in the indictment against the inefficiency and ineffectiveness of the Department of Civil Aviation. If it was worth its pay it ought to have had dependable wireless communication at Le Bourget a year or more ago.

Fortunately Mr. MacIntosh and his mechanic Mr. Dismore were thrown out and the former merely strained his foot. He was taken to a French hospital in Paris, but managed to escape and got to Croydon on Tuesday accompanied by his brother, an exact replica of himself.

#### JANUARY 20th:

Nil.—Weather impossible.

#### JANUARY 21st:

Nil.—Weather impossible.

#### JANUARY 22nd:

Nil.—Weather impossible.

### Inland Flying at Croydon.

Jan. 16th.—D.H., DH9 return Stag Lane (Broad).  
Jan. 17th.—M.W.T. Co., Avro tests (Muir).  
Jan. 18th and 19th.—Nil.  
Jan. 20th.—M.A., Spad test (Challoux); M.W., Avro tests (Shaw).  
Jan. 21st.—Nil.  
Jan. 22nd.—I.L., DH8 test (Holmes).

### Cross-Channel Statistics.

Week ending January 22nd:—  
Machines, 14; Passengers, 14; Crews, 21; Total Personnel, 35  
Corresponding week last year:—  
Machines, 15; Passengers, 12; Crews, 17; Total Personnel, 29

One of the air lines discovered on Wednesday that water is only a very poor substitute for petrol in the running of internal combustion engines.

Mr. Powell put up a good performance on the "Vimy" on Wednesday. He was taking off with a heavy load and just as he got clear of the ground one engine lost half its revs. He managed to stagger along and by a fine piece of piloting he brought the machine round and landed safely. Then the trouble was remedied and he started again.

Mr. Muir was testing a Bristol "Fighter" on Monday, which the Aircraft Disposal Company are presenting to H.M. The Queen of the Belgians. It is doped all over with silver aluminium dope and the effect is singularly pleasing. The engine is a Rolls-Royce "Falcon."

On Thursday the same firm were exhibiting two white D.H.9s converted to three-seaters, which have been ordered for use by a Swiss concern. Mr. Muir took up various enthusiasts in a howling wind and pouring rain. One is told that the A.D.C. are removing the remnants of what were once Bessonneau hangars from the front of the big shed. This will greatly add to the appearance of the Company's premises besides enlarging the landing area.

On the other side of the aerodrome in what was the 5s. enclosure on the race day, some new hangars are being erected. The lucky occupants of these will save a lot of money which goes in taxing round to the sheds.

Mr. Muir was testing on Tuesday a Renault Avro which the Surrey Flying Services have erected and converted for Marconi's. He had a slight mishap, the engine "petering" out as he was taking off and compelling him to land in the rough grounds at the northern end of the aerodrome. Mr. Shaw took the machine over for Marconi's on Friday.

The A.D.C. "Snipe" has been performing again during the week and Mr. Muir has been up at Liverpool recently testing a Parnall "Panther" (not a "Puffin"). This machine will probably make its appearance at Waddon shortly.

# INSTONE AIR LINE

51, LEADENHALL STREET, E.C., and  
LONDON TERMINAL AERODROME, CROYDON.

Telephone: AVENUE 3616.

Mr. Shepperson, who will be remembered as an old A.T. and T. pilot, has returned to flying and was at the aerodrome last week. He is doing some ferry work for the A.D.C.

Major Foot went off to Brussels on Monday on a D.H.9 with an engine cowl tied on underneath the fuselage. This was at first mistaken for the Major's Foot Bath.



#### A ROYAL BRISTOL.

The silver Bristol Biplane (Rolls-Royce Engine) presented by the Aircraft Disposals Co. Ltd. to Her Majesty the Queen of the Belgians. The machine is here seen starting for Brussels with Capt. Muir as pilot and Col. Darby of the A.D.C. as passenger.

Messageries Aériennes are to use "Goliaths" and the 4-engined Spads this year, and S.N.E.T.A. are having "Goliaths" with Maybach engines.—G. D.

#### Stag Lane.

On Monday, the 16th, Mr. George Powell flew the new commercial monoplane D.H.29. He tells one that it is an exceedingly nice machine to handle and is easy to land and take off.

It is entirely free from any curious tricks and its high speed is even better than was at first expected, and its landing speed is low.

The cabin is well fitted up and seats ten passengers, and there is room for one extra beside the pilot. Mr. Powell states that the view from the pilot's seat is splendid.

Capt. Payne, the Air Ministry's pilot, is taking, or has already taken, the machine to Martlesham for type tests.

The machine's registration number is G-EAYO.

#### Creswell.

The Berkshire Aviation Tours are flying at Creswell, near Mansfield, until the 26th inst., and considering the weather, if anyone has any patience left to consider it, they have done extraordinarily well. Their total for the first three days was 123 passengers, and of these 105 were taken up on Sunday alone, Mr. Ferrand thereby creating a record for himself, he never having been up to the "100 per day mark" before.

By some really good publicity on their part in advertising by handbill the vagaries of our climate, with such phrases as "Switzerland at Home!" "See the Snow-covered Dukeries from the Air," etc., they not only risked a thaw, but drew a crowd of 2,000 people to the aerodrome, quite 500 of whom were children.

This, compared with the attitude of most people, who consider a fire the only thing worth looking at under the present atmospheric conditions, is very creditable, and only goes to prove what can be accomplished by a "live" concern, plus a trusty Avro.

#### AN APOLOGY.

Split infinitives are criminal, so also are terminal prepositions. They are not, however, capital offences in English literature should be the misquotation. Therefore one apologises to one's readers on behalf of the miscreant who substituted the word "ills" for "shocks" in the quotation in one's Crovdon notes of Jan. 19th that should be familiar to all: "The heartache and the thousand natural shocks that flesh is heir to."

Unfortunately one was ill in bed and unable to shepherd the said quotation to safety, and its revised form nearly caused a relapse. One feels sure that Shakespeare was almost as clever as Kipling and "Tis a consummation devoutly to be wished" that what he has said he has jolly well said, and should be allowed to go on saying it.—G. D.

[That is all very well, but "G. D." being ill, wrote "ills," so that is that.—Ed.]

#### THE WORLD'S AVIATION RECORDS.

UP TO DECEMBER 31ST, 1921.

(Issued by the Royal Aero Club as representing the British Empire on the Fédération Aéronautique Internationale.)

**DURATION (America).—Pilots:** E. Stinson and L. Bertaud. Date: Dec. 26th and 30th, 1921. Machine: J.L.6 monoplane (Junkers). Motor: B.M.W. 185 h.p. (Bayerische Motor Werke). Duration of flight, 26 hr. 19 min. 35 sec.

**DISTANCE:** Returning to point of departure without alighting (France).—Pilots: Lucien Bossoutrot and Jean Bernard. Date: June 3rd and 4th, 1920. Machine: Farman "Goliath." Motor: Two Salmsons, 260 h.p. Distance, 1,915.2 kilometres (1,190 miles).

**ALTITUDE (America).—Pilot:** Major Rudolph W. Schroeder. Date: Feb. 27th, 1920. Machine: Lepère. Motor: Liberty, 300 h.p. Height, 10,093 metres (33,114 ft.).

**SPEED OVER A DISTANCE OF 100 KILOMETRES (Italy).—Pilot:** Brack Papa. Date: Oct. 1st, 1921. Machine: Fiat. Motor: Fiat, 700 h.p. Time: 20 min. 5 2/5 sec. Speed, 298.66 kilometres per hour (185.58 miles per hour).

**SPEED OVER A DISTANCE OF 200 KILOMETRES (France).—Pilot:** Georges Kirsch. Date: Oct. 1st, 1921. Machine: Nieuport-Delage. Motor: Hispano-Suiza, 320 h.p. Time: 42 min. 39 4/5 sec. Speed, 281.272 kilometres per hour (174.77 miles per hour).

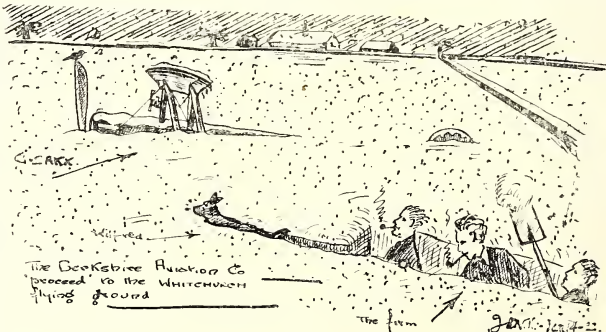
**SPEED OVER A DISTANCE OF 1,000 KILOMETRES (France).—Pilots:** Lucien Bossoutrot and Jean Bernard. Date: June 3rd and 4th, 1920. Machine: Farman "Goliath." Motor: Two Salmsons, 260 h.p. Time: 10 hr. 19 min. 46 sec. Speed, 96.81 kilometres per hour (60.155 miles per hour).

**SPEED OVER A DISTANCE OF 1,500 KILOMETRES (France).—Pilots:** Lucien Bossoutrot and Jean Bernard. Date: June 3rd and 4th, 1920. Machine: Farman "Goliath." Motor: Two Salmsons, 260 h.p. Time: 16 hr. 42 min. 8 sec. Speed, 89.808 kilometres per hour (55.804 miles per hour).

**GREATEST SPEED OVER A DISTANCE OF ONE KILOMETRE (France).—Pilot:** Sadi Lecoq. Date: Sept. 26th, 1921. Machine: Nieuport-Delage. Motor: Hispano-Suiza, 300 h.p. Speed, 330.375 kilometres per hour (205.223 miles per hour).

**USEFUL LOAD TRANSPORTED (ALTITUDE) (England).—Pilot:** Thierry. Date: Oct. 10th, 1920. Machine: Breguet. Useful load, 250 kilos (551 lb.); altitude 6,965 metres (22,851 ft.).

**USEFUL LOAD TRANSPORTED (ALTITUDE) (England).—Pilot:** Capt. C. T. R. Hill. Date: May 4th, 1920. Machine: Hand-





ley Page. Motor: Two Napier "Lions," 450 h.p. Useful load, 1,674 kilos (3,691 lb.); Altitude, 4,267 metres (13,999 ft.).  
**USEFUL LOAD TRANSPORTED (DURATION)** (England).—Pilot: Capt. C. T. B. Hill. Date: March 1920. Machine: Handley Page. Motor: Two Napier "Lions," 450 h.p. Useful load, 1,674 kilos (3,691 lb.); Duration, 1 hr. 20 min.

### DEVELOPMENTS IN FRANCE.

A correspondent in Paris writes:—

"With all the Cabinet changes here, M. Laurent Bynac remains Under Secretary for Military Aviation, and the other aviation services remain unchanged, excepting of course for the new War and Admiralty Ministers."

"M. P. F. Flandin has been elected as President of the Aero Club."

"The Farman air line, the Cie. Générale des Transports Aériens, has been amalgamated with the Messageries Aériennes, and Mr. Henry Farman joins the new board."

Mr. Pierrot, who was previously secretary to Colonel Sacconey, of the Service de Navigation Aérienne, has joined the Messageries Aériennes as Technical Manager. Two new Goliaths are on order, fitted with 300-h.p. Renault engines, and equipped for night-flying, including the Le Prieur navigating instruments."



**A DEVELOPMENT IN FRANCE.**—The only extant photograph of M. L. R. Taft-Cox in a hat.

"A Union of Professional Parachutists has been formed, including Mlles. Andrée Blanche, Renée Jacquart, Ennemonde Diard and Messrs. André Thouin and Henri Gendarme. Their tariff is 1,000 francs per descent."

"The Training Centres for Reserve pilots have been very successful, the average flying done amounting to 400 hours a month. Seven centres have been operating this last year, and the number is being increased."

### THE WRIGHT-LANGLEY CONTROVERSY.

Apropos the recent attack on Mr. Glenn Curtiss and the authorities of the Smithsonian Institute by Mr. Griffith Brewer in his lecture before the Royal Aeronautical Society, Mr. Lyman J. Seely, who will be remembered by many friends in this country as the representative of the Curtiss Company over here during the War, sends a letter which is of very considerable value in the controversy. He writes as follows:—

"In the fifth paragraph of page 358 you quote Mr. Brewer in part as follows:—

"Langley and the Wrights had been working concurrently hundreds of miles apart for several years, and both had approached the final stage of the independent experiments at the same time."

"That is a very misleading statement. Dr. Langley's scientific experiments began years before the Wrights emerged from the obscurity of their bicycle repair shop. Two men of sufficient technical equipment to appreciate Dr. Langley's work had access to it. They were the late Octave Chanute and Dr. Alexander Graham Bell. Dr. Langley was assisted in his experiments by several young engineers, among them C. M. Manley, A. M. Herring, and Huffaker."

"Mr. Chanute not only had more or less personal access to the results of Dr. Langley's experiments, but after the complete success of Dr. Langley's steam-driven models he employed Herring up to the time, or very near it, when he turned all his data over to the Wright Brothers. Later the Wright Brothers, unless I am at fault, had the assistance of Mr. Huffaker in designing the twin propellers which alone made the flight of their machine with its under-powered motor a possibility. These propellers were practically replicas of the propellers Mr. Huffaker had designed under the direction of Dr. Langley for his own machine."

"If the pertinence of these facts is not sufficiently obvious the idea may be developed a little further. Chanute gave to the Wrights engineering data obtained direct and through Herring from Dr. Langley. The Wrights in turn produced a machine that would fly."

"Dr. Bell gave the results of his own experiments and what he had from Dr. Langley to Glenn Curtiss and the Aerial Experiment Association. They in turn produced machines that would fly."

"The only difference between the two groups lay in their later development. When the sources of their inspiration, or engineering knowledge, died the genius of the Wrights for designing flying machines seems also to have disappeared, though they had behind them a wealthy group of financiers and every encouragement to continue their work. The Cur-

tiss group, on the other hand, had little or no money and every sort of oppression to contend with, but still Mr. Curtiss continued to develop new and useful types."

"To say that the Langley machine was deliberately 'improved' before the first Hammondson trials is an absurdity. The facts are quite to the contrary. Only a limited amount of money was available for the work, and time was an element of importance, so, instead of carefully rebuilding or replacing such of the beautifully made split bamboo ribs as had been broken ribs of solid spruce were substituted, and in place of the fine cover provided by Dr. Langley surfaces of ordinary aeroplane fabric were used. Certainly neither of these changes could be regarded as improvements."

"The Manly engine was not provided with magneto ignition, as might easily have been deduced, and old-fashioned dry-cells bouncing loosely about in a box were employed. Add to these the four hundred pounds of floats it was obliged to pull out of the water and the fact that the old bus was able to fly at all becomes amazing. What other machine of the vintage of even 1908 could equal the performance?"

### A ROLLS-ROYCE RUN.

In the course of a conversation with Mr. Lappin of Rolls-Royce Ltd. one made the statement that one had never been in a Rolls-Royce car. Mr. Lappin was very sorry for one, and in further conversation he worried out of one that one had not seen "Chu Chin Chow" either. Mr. Lappin was unable to remedy the latter malady, but the former he could and would rectify immediately. Consequently on a recent fine morning one found oneself seated in the latest type of Rolls-Royce car with Major Cox at the wheel and Mr. Lappin behind.

One's previous experience of cars has been confined to such things as a G.N. or the Editorial "Merc," consequently the first thing that struck one was the extreme amplitude of everything in the Rolls. Although it was a cold day one felt no cold wind at all, the wind screen being large and efficacious and the seat being deep. And needless to say there is no noise or vibration.

When one first sees the car one thinks it looks too large to be manageable in traffic, but under Major Cox's superb handling this idea is quickly dispelled, and later when one led him through the byways of Kent and along country tracks into which the Rolls just fitted one was amazed at its handling.

We made Croydon Aerodrome in twenty-five minutes from Conduit Street, and here we dropped Mr. Lappin, then on past Kenley aerodrome and across country to Westerham Hill.

This the Rolls took, all but the last few yards, on top, which is no mean feat for a heavy car.

Soon after passing the top we came to the old familiar Salt Box. This now stands actually on Biggin Hill aerodrome, the sheds being on each side of it. As we passed there was a Handley Page together with a few other machines standing out on the aerodrome.

Then via Downe we tried the notorious pimple called Cudham Church Hill. Here again the Rolls all but took it on top, and one believes that it was only lack of familiarity with the hill that prevented Major Cox bringing it right up on top gear.

And so via Hayes Common and Croydon back to Croydon aerodrome for lunch. On thinking over the trip it is not difficult to understand how it is that Rolls-Royce have established themselves in the position in the motor world which they now hold.—G. D.

### PERSONAL NOTICES.

#### DEATHS.

PEACE.—On Jan. 13th, at Hinali, Mesopotamia, killed in collision during formation flying, F/Lt. Albert Grandaes Peace, A.F.C., No. 8 Sqdn. R.A.F., husband of Dorothy Helen Peace, of Salisbury.

WILLIAMS.—At Connaught Hospital, at Farnborough, on Jan. 10th, as the result of an aeroplane accident, F/Lt. F. T. Williams, M.B.E. According to the *Times* F/Lt. F. T. Williams, R.A.F., died in Connaught Hospital, Farnborough Heath, from injuries received in an aeroplane crash-landing on Dec. 27. F/Lt. Williams was piloting a "Bee" machine, when apparently an unexpected dive ended in the machine crashing through the roof of an army hut in Marlborough Lines.

#### ENGAGEMENTS.

ANDERSON-JOSEPH.—The engagement is announced between F/Lt. Walter Francis Anderson, D.S.O., D.F.C., 45 Sqdn., R.A.F., Almazra, Egypt, and Phyllis Mary, only daughter of Mr. W. O. Joseph, Zeltoun, Cyprus.

BARBOUR-MACKAY.—A marriage has been arranged between R. L. Barbour, D.F.C., Flying Officer R.A.F., eldest son of Mr. and Mrs. R. L. Barbour, Croydon, and South Africa, and Edith Mary, the only daughter of Lt.-Col. J. D. Mackay, D.S.O., and Mrs. Mackay, of The Romans, Ashvale, Surrey.

CARRIEY-ANDERSON.—An engagement is announced between Lord Carbery, some time of the R.N.A.S., and later of British East Africa, and Miss Anderson, of The Lodge, Riverdale, Nairobi.

#### MARRIAGE.

NEWELL-WEDDELL.—The marriage took place on Jan. 18th, at St. George's, Prices Road, between Grp/Capt C. L. N. Newell, C.M.G., C.B.E., A.M., R.A.F., and Mrs. Weddell.

#### BIRTHS.

POTTS.—On Jan. 20th, at Brussels, to Lucette (Butlinck), wife of Maj. J. Forgan Potts, late R.A.F., a daughter.

ROGERS.—On Jan. 19th, at 3, Courtfield Gardens, the wife of F/O. W. Roland Rogers, R.A.F.—twin sons.

WEST.—On Jan. 17th, at 18, High Street, Uxbridge, to Peggy, wife of F/Lt. Theodore James West, M.C., R.A.F.—a son.



## INDEX TO ADVERTISERS

Aecles & Pollock, Ltd. ....	70	Iustone Air Line ....	73	Short Bros., Ltd. ....	Inside Back Cover
Armstrong Siddeley Motors, Ltd. ....	70	London Die Casting Foundry Co., Ltd. ....	76	S. Smith & Sons (M.A.), Ltd. ....	69
Bristol Aeroplane Co., Ltd. ....	Back Cover	Napier, D., & Son Ltd. ....	61	Supermarine Aviation Works, Ltd., The ....	Inside Back Cover
Cellon, Ltd. ....	69	Parnall, G., & Co. ....	67	Tait-Cox and James ....	76
Cunard Line ....	76	Roe, A. V., & Co., Ltd. ....	Inside Front Cover	Titanine, Ltd. ....	Front Cover & 69
de Havilland Aircraft Co., Ltd., The ....	67	Rudge-Whitworth ....	70	Westland Aircraft Works... ..	62
ey Aviation Co., Ltd., The ....	65	Sankey, J. H., & Son, Ltd. ....	76		

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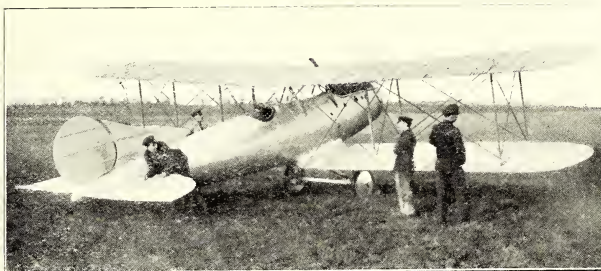
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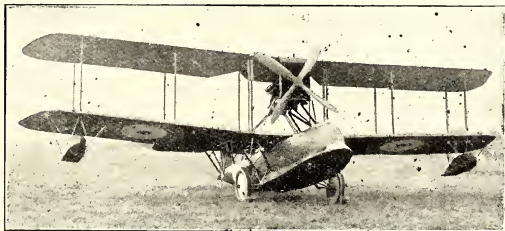
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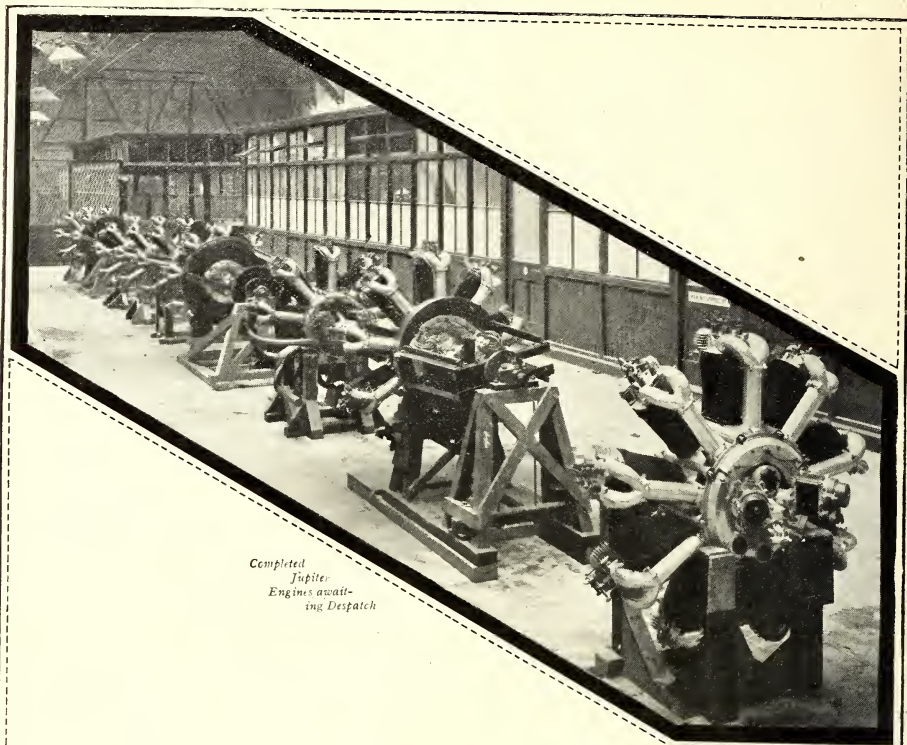
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C. G. Grey

Vol. XXII. No. 5.

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[Registered at the G.P.O.  
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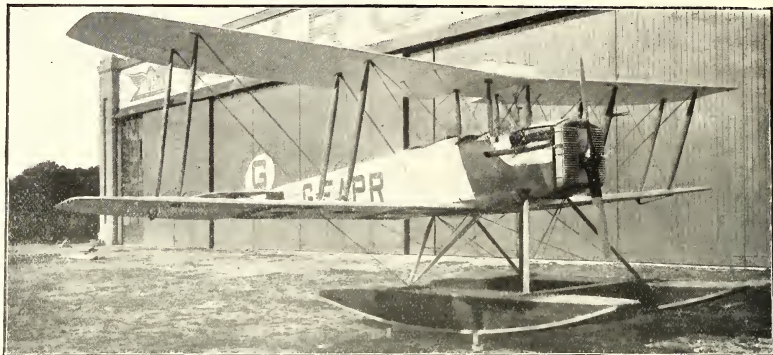
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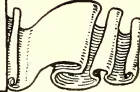


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## ON THE PROBLEM OF 1922.

Before the next issue of THE AEROPLANE appears we shall have suffered another of the Air Ministry's comic "Conferences," and the daily news-sheets will have treated us to columns about the "Air Parliament" full of reports of the least important things said by the conferenciers. So far as the Great British Public is concerned it hardly seems likely that the Conference will be worth the money it will cost. But as quite a number of the people who are booked to read papers have a really useful knowledge of their subjects it seems well worth while to devote a few columns of this paper to some problems with which they and those others who are to discuss matters on the second day of the Conference, would do well to deal.

One is encouraged to do so by the fact that subjects which have been discussed sufficiently frequently and vehemently in THE AEROPLANE have generally succeeded in becoming the centre of interest in the aeronautical community some months or years later. For example the benefits of high-lift wings have been preached by Captain Sayers for about three years, and to-day several firms are actually building machines so designed.

Similarly the variable camber wing has been strongly advocated ever since the cessation of hostilities with Germany made it possible to disclose the good work done by the Fairey Company's wings. A week or so ago the wonderful results achieved by a special weight-lifting machine thus equipped were published. And now other designers are beginning to think seriously of this method of getting better value for their engine power.

Furthermore, as soon as the theory of the Handley Page slotted wing was made known this paper urged that it should be developed. To-day, a year or two later, several machines so fitted are being built for the Air Ministry, and a number of others are being constructed by the aircraft factories of the United States Government. So that there is distinct hope that British constructors other than the Handley Page firm will some day accept Mr. Handley Page's generous offer of a free licence to build experimental machines under his patents.

In fact, when one looks back over the history of British Aviation before, during and since the war it is highly satisfactory to see how many improvements in aircraft design which were advocated in THE AEROPLANE have come into general use at long last to the benefit of aviators and the Aircraft Industry. As one party to a discussion on this point remarked, "It is surprising how many hares THE AEROPLANE has started." Whereupon a cynic added, "Not to mention how many red herrings."

However, be that as it may, the fact remains that it is well worth while to keep on hammering into the Air Ministry and the Aircraft Industry those problems which must be solved if aviation is to make any progress during 1922. Therefore let us to our subject, the points which ought to be discussed at the Air Conference.

### Commercial Flying.

So far as one can gather the Conference will deal altogether with Civil Aviation. The Royal Air Force very properly is to be left out of it. Therefore let us discuss mere commercial matters.

In the first place presumably everybody will admit that the three things necessary to the success of Civil Aviation are an aeroplane which will carry a paying load at railway fares and an aeroplane which will be practically free from the danger of fire and a system of ground communication which will make it safe for commercial aeroplanes to fly in bad weather. Let us take them in the reverse order.

### Where Civil Aviation Has Failed.

For the past three months the traffic returns at Croydon have been a disgrace to British Aviation. The number of blank days when there has been no flying has been higher than it was during the bad Winter of 1919-20, when Air Transport and Travel Ltd. was running a purely experimental service between London and Paris. And this in spite of the fact that machines are better, engines are far more reliable,

pilots are much more experienced, and over-generous subsidies are paid for each trip—which they were not in the A.T. and T. days.

Why is it so? Simply because in A.T. and T.'s time everybody was full out to demonstrate to the World at large what aeroplanes could do, relying on the Department of Civil Aviation so to organise the air routes that it would be possible to navigate safely in bad weather later on. The pilots to-day are not a bit less brave than they were two years ago, but they have done more than their share of pioneering the air routes, and they have very sensibly come to the conclusion that it is not good enough to go on risking their lives at the expense of a decent commercial traveller while the Department of Civil Aviation sits still and tries to come to a decision about something.

Consequently a pilot to-day is not going to push off into a thick fog "hanging on his prop," so to speak, in the hopes of running into fair weather farther along the route. Nor if he starts in fair weather and runs into fog is he going to carry on and trust to his own luck and skill to find his aerodrome and get into it safely. Two years ago it was all very fine to do such things for the honour and glory of British aviation. But to-day it simply is not good enough.

Over a year ago poor Robert Bager who was killed while getting off in a fog wrote a most amusing letter to this paper relating how he was brought into Croydon aerodrome by directional wireless as if he had "been pulled in on a string," as he put it. A couple of months ago Mr. McIntosh was similarly towed in by wireless. But apparently Croydon is the only place which can be so found. There appears to be no directional wireless communication elsewhere along the route to Paris.

When on top of this it is realised that the French meteorological information is notoriously unreliable both as regards its continuity and its actual statements of facts it is not difficult to understand why pilots refuse to fly or descend in the course of flights when two years ago they would have gone through with it. The blame for the failure lies entirely with the Department of Civil Aviation.

### Lack of Communication.

It should have been possible long ago to have established our own observation and wireless posts at Le Bourget, Beauvais, Abbeville and Marquise, so that pilots could be told as they went along whether fog was down to the ground or whether there was clear air under it to make landing possible. The other day Mr. Frank Courtney took his machine up over low clouds and navigated by compass to London in bright sunshine when other pilots did not start or groped along in the mist. He took a chance which perhaps might not be justifiable in a less able pilot. But, with adequate ground organisation and proper directional wireless every pilot ought to be able to do that same thing.

It is absolutely the fault of the Department of Civil Aviation that it is not possible. So far as getting up and down through fog or thick clouds is concerned modern instruments such as the Read indicator make it as safe and simple as flying in first-class visibility. All that is needed is proper wireless to keep the pilot on his course, to tell him his whereabouts along the route, and to warn him to come down in time if the fog is actually so low as to make landing dangerous.

Such wireless apparatus has existed for a year and is being improved almost daily. The Marconi Company has done much in this direction. The R.A.F. Instrument Design and Experiment station at Biggin Hill has added greatly to the knowledge and the actual apparatus available. And various other firms, such as the Radio Co., as well as private individuals are continually producing new inventions many of which ought to have been in use during the past few months, such as the new change-over switch which, one is told, makes wireless conversation about as simple as using an ordinary telephone.

### Muddled Policy.

Instead of spending its money on equipping machines and ground stations with the latest apparatus and on organising



Civil Aviation so as to make it a working proposition, the Department of Civil Aviation hands out subsidies so generously that owners can afford to spend quite large sums on new uniforms and paint when the money might be much better spent by the Department itself on new instruments and staff on the ground. And in spite of this generosity the Department of Civil Aviation, at any rate in the last financial year (ending March 31st, 1922) failed to spend most of the money allocated to it and had to return it to the Treasury, by whom it was allocated to paying debts contracted by the Ministry of Munitions.

In plain simple language the Department of Civil Aviation has proved itself to be thoroughly incompetent and has failed lamentably in the task committed to it. Civil Aviation would in fact have made more progress if it had been left to itself to "conduct its own manoeuvres in its own damned tinker fashion" (as Mr. Kipling says) and had merely had to submit to a competent authority in the matter of licences so as to prevent the use of unairworthy machines by incompetent pilots.

Consequently the Department of Civil Aviation ought to be abolished or else it ought to be entirely re-organised.

### Fire-Proof Aircraft.

That being that, so far as the Department of Civil Aviation is concerned, let us consider the question of the fireproof aeroplane. Personally the thing which scares one of flying more than anything else is the fear of fire, either in the air or as the result of a comparatively innocuous crash such as that in which Bager and his mechanic and a passenger were burned to death a little over a year ago. And other people are similarly affected in their attitude towards flying.

Quite a considerable amount of money and brains has been expended on anti-fire devices and designs, as was shown by General Bagnall-Wild's lecture and the consequent discussion last week. And yet nobody at that lecture touched on the obvious (and Irish) solution of the problem—fireproof fuel. There was a good deal said about fireproof bulkheads, fireproof petrol pipes and so forth. But nobody said anything about abolishing petrol.

There is even a Fire Prevention Committee appointed by the Air Ministry. But it also seems to be devoting most of its very high intelligence to preventing petrol fires rather than to finding out how to avoid using petrol.

### Why Not Heavy Oil?

After the lecture one mentioned this point to a member of the Fire Prevention Committee who said that the use of heavy oil fuel had been considered, but that it was found that heavy oil under certain circumstances caught fire more easily than did petrol. The particular circumstance seems to be that if petrol falls onto a red-hot or nearly red-hot exhaust pipe it evaporates before it catches fire, whereas if heavy oil does so it fries and then catches fire without evaporating.

Now one submits that if no worse objection than that can be found to heavy oil it is quite time the Department of Research set out to produce a heavy oil engine. For it seems much easier to prevent a fire from such a cause than it is to prevent fires from any of the many causes which set light to petrol.

The great danger in the air is that petrol vapour may catch fire from so many causes. A punctured float in a carburettor may cause flooding which will pour petrol into the engine housing and liberate vapour to catch fire from the magneto. A pipe-joint may crack or shake loose with similar results.

Many of the R.N.A.S. people will remember how a number of Short bombers caught fire on the ground owing to flooding carburettors, and many R.F.C. people will remember how a number of D.H.s with Raf 34 engines caught fire in the air owing to petrol pipes breaking at the carburettor joint. Such accidents could not occur if heavy oil were used, or even ordinary paraffin.

Also there is the possibility of an escape of petrol or vapour from tanks in fuselages or in the hulls of flying-boats being set on fire either by somebody striking a match or by the vapour reaching the exhaust outlet and flashing back, say when doing a very slow glide or side-slip. This could not happen with heavy oil.

### Crashes and Fires.

There is much argument as to how and why machines catch fire after a crash. It will have been noted that rotary engine machines are much less liable to catch fire in a crash than are stationary-cylinder machines. This seems to be due to the fact that a stationary-cylinder engine will "run away" after the air-screw is broken and so will spout flame from a broken exhaust-pipe or will continue to spark at the magneto or will emit fat sparks from a fractured sparking plug or a shorted high-tension lead, thus setting fire to the petrol from the burst tanks or from the upset car-

burettor. No fire could result in such cases with heavy oil or paraffin.

The hot exhaust-pipe bogey in the case of heavy oil seems to be greatly exaggerated. In the first place, even if the exhaust-pipe did happen to be very hot it does not seem necessary that the oil should fall on it. Secondly, heavy oil would not gush out as petrol does, so a thin piece of metal like an exhaust-pipe or manifold would probably cool down below flash-point long before the thick treacle oil reached it. Thirdly, if the pipe were placed so that it was properly cooled it would hardly reach a heat sufficient to set fire to anything. Certainly an arrangement like the "Ad Astra" silencer would stand a very poor chance of getting so hot.

### Why Not?

Thus fire in the air, the deadliest of all dangers, can be almost absolutely avoided and the risk of fire after a crash can be minimised by using heavy oil. So why not develop the heavy oil engine?

The only objection one has met so far has been that a Diesel engine has to weigh ten times (or thereabouts) as much as any ordinary four-stroke engine, because if it misses fire once it fires a double charge next time and blows itself to pieces unless the cylinder walls are inches thick, or something of that sort. Is that a valid objection to starting research work in the effort to find an engine which does not misfire or does not fire a double charge if it misfires or does not blow itself to bits if it fires a double charge?

First of all, need a heavy oil engine necessarily be run on the Diesel principle? Secondly, if it misfires once cannot the second charge be stopped from entering, or rather cannot each charge be injected by the explosion of the preceding charge much as the firing of a Lewis gun loads the next cartridge? Thirdly, has anybody ever tried making a Diesel engine out of anything except cast iron? Cannot we do something better than the ordinary Diesel cylinder with our modern high tensile aircraft steels?

Incidentally, it has been reported in various papers that Herr Junkers has produced an aerial Diesel engine. He has done nothing of the sort. All he has done is to build a petrol engine using direct injection of fuel, much as the fuel was injected into the Antoinette of 1908. So there is still a chance for us to antedate German ingenuity.

If half the money which the Department of Civil Aviation failed to spend during the financial year 1920-21 had been spent on research in heavy oil engines we should by now be in a fair way towards being rid of the danger of fire in the air or after a crash. At the last Air Conference Sir Edward Ellington, Controller of Supply and Research, or Sir Frederick Sykes, Director-General of Civil Aviation, one forgets which, talked airily of steam-engines for aeroplanes, but nobody mentioned the simpler and safer heavy oil engine.

Also one or both of them seemed quite enthusiastic about helicopters, and one gathers that severally or conjointly they allocated quite handsome sums to the much-promising Mr. Brennan for work on his "flying-straight-up" machine, of which much has been heard and little seen. But neither of them, for all their distinguished careers and their doubtless well-merited titles, seems to have struck the simple solution of the fire-prevention problem, the heavy oil engine.

Years before the war, when the fire danger was just as important as it is now, Mr. Howard Wright suggested that if we took our leading aero-engine designer and our leading Diesel expert and our leading metallurgist and locked them up in an experimental workshop on the understanding that they should not come out till they produced a satisfactory aero-Diesel engine we should get that engine in three months. Perhaps the persuasive eloquence of money might have the same effect.

### The Paying Aeroplane.

Lastly we come to the aeroplane which will carry a paying load. We do seem to have made some little progress in this direction, thanks entirely to the acumen of the Director of Research who encouraged the development of the Fairey variable camber and of the Handley Page slotted wing. But certainly we owe nothing to the Department of Civil Aviation which, with so much money in hand, might have done a great deal by ordering machines so fitted and loaning them free of charge to the existing air lines. Also, as already stated, several firms are building machines with high-lift wings as advocated in this paper any time in the past three years.

But besides making wings more efficient there is much to be done in making the whole aeroplane more efficient. It is quite time we got away from the flying chicken-coop with its masses of struts and wires and its sawed-off wing-tips and its slab-sided body and its protruberant bits and pieces and its silly old radiators wrongly designed and stuck in the wrong place.

One does not pretend to know whether the Woyewodski de-

sign is a sound patent or not, but one does know that it is a step in the direction of designing an aeroplane which is not first cousin to a box-kite. It is said that there was once some question of a machine of this design being ordered by the Department of Civil Aviation but that it was turned down because the passengers could not see well out of it, as originally submitted. Such a reason is about on a par with most of that Department's acts of commission and omission, so one feels inclined to believe the story.

### Water Without Brain.

As to the radiators used on the aeroplanes of to-day, they would be a joke if they were not a tragedy. At General Bagnall-Wild's lecture on "Aerial Braker" wanted to know why we carry gallons of water into the air when we might use the air to cool the engine. Perhaps he is right in believing in the air-cooled engine. Personally one thinks he is, but so far the water-cooled engine has made the best showing. And the astonishing thing is that it has done so in spite of the Radiator Section of the Technical Department at the Air Ministry, for what that department does not know about radiators and radiation and convection would fill volumes.

The Radiator Section has apparently some comic theory that the radiator which shows the best results in a 30 or 40 mile an hour wind tunnel will also show the best results in an aeroplane at between 120 and 150 miles an hour. The result is that all our aeroplanes are carting around about twice as much water and radiator as is necessary, and those which are specially fitted with "tropical" radiators carry something like 50 per cent. extra over and above that.

This precious Section does not seem yet to have discovered that a circle of about two feet diameter at the centre of a nose radiator is useless and just so much dead weight. Nor does it seem to know that at 120 miles an hour or so the air jams in the long narrow tubes which it specifies and only

trickles out at the back. Nor does it seem to understand that a good free flow of water will cool quicker than the film which squeezes laboriously through the spaces allowed by "Air Board Specification."

If one had space one could tell several quite funny radiator stories, beginning with Mr. Koelhoven's experiences of the official specification imposed on the big commercial "Bat." But it must suffice to say that commercial and Service aeroplanes would have been very much more efficient if the Radiator Section had never existed.

### Does Commercial Aviation Count?

Of course there are many other matters concerning the design of commercial aeroplanes and engines and the operation and organisation of air lines on which one could discourse. But space is limited in these days of high prices and bad trade, so one commends these few to the consideration of those who are taking an interest in the Air Conference. It will be amusing to see whether any of the speakers touch on these eminently practical points, which, simple as they may seem, are essentially the keys to the success of Civil Aviation.

Personally one is not gravely concerned about Civil Aviation at all. Air transport will come all in good time when aeroplane and engine makers produce machines which can be run at a profit. But spoon-feeding with subsidies is the worst way of encouraging it.

Also one has got to have the right machines and the right men at the game before it is worth while to encourage it. As Mr. Ernest Newman remarked, apropos the lack of encouragement for British composers, "You can't make a silk purse out of a sow's ear merely by encouraging the sow."

After all, what really matters is our First Line of Defence, and so long as all is well with the Royal Air Force there is little need to worry — C. G. G.

## R.A.F. INTELLIGENCE.

### R.A.F. Appointments.

Grp/Capt. A. M. Longmore, D.S.O., to R.A.F. Depot (I.A.). (Super-numerary.) Whilst attending Army Staff College, Cambridge. 21/1.  
Wing/Cmdr. L. A. Pattinson, D.S.O., M.C., D.F.C., to R.A.F. Depot (I.A.). (Super-numerary.) Whilst attending Army Staff College, Cambridge, on ceasing to be attached to School of Air Cooperation. 23/1.  
Wing/Cmdr. C. B. Hynes, D.S.O., from R.A.F. Depot (I.A.) to Royal Aircraft Establishment, S. Farnborough. For experimental duties. 10/1.  
S/Ldr A. A. B. Thomson, M.C., A.F.C., from R.A.F. Depot (I.A.). To command No. 39 Sqn. (I.A.). 21/1.

S/Ldr T. S. Impey, from No. 39 Sqn. (I.A.) to R.A.F. Depot (I.A.). (Super-numerary.) 21/1.  
S/Ldr T. Whicker, M.C., from Inter-Allied Aeronautical Commission of Control (Germany). To command No. 100 Sqn. (No. 11 (Irish) Wing). 1/2.

S/Ldr B. E. Smythies, D.F.C., from R.A.F. Depot (I.A.). To command No. 3 F.F.S. (I.A.). 28/1.  
S/Ldr W. B. Cushion, from I.A.A.D. to No. 29 Grp. H.Q. (C.A.). 23/1.

F/Lt R. B. Munday, D.S.C., from Inter-Allied Aeronautical Commission of Control (Germany) to R.A.F. Depot (I.A.). (Super-numerary.) 16/1.

F/Lt R. O. Compston, D.S.C., D.F.C., to R.A.F. Depot (I.A.). (Super-numerary.) 30/11.

F/Lt A. S. Mackell, to R.A.F. Recruiting Depot, Portsmouth, on completion of duty at R.A.F. Recruiting Depot, Plymouth. 18/1.  
From the London Gazette, Jan. 24th.—The following Flight Cadets having successfully passed out of the R.A.F. (Cadet) College, are granted permanent commissions as Pilot Officers, with effect from Dec. 20th, 1921:—G. H. Mills, J. B. Barrett, R. N. White, W. J. M. Akerman, P. R. Rivington, N. C. Haver-Hines, M. B. Mackay, R. D. Whelan, R. A. R. Langley, J. B. Brown, C. E. Bernard-Smith, F. C. T. Rowe, D. W. F. Bonham-Carter, F. G. S. Mitchell, W. A. D. Brook, C. W. Gore, R. A. B. Stone, C. L. Falconer, G. Combe, T. J. Desmond, G. W. Gay, E. V. S. Lacey, C. M. O. O. Springfield, C. J. Stone, R. W. Pontifex, M. H. Garnons-Williams, J. G. Hawtry.

Grp/Capt. J. G. Heaton, C.B., D.S.O., from R.A.F. Depot (I.A.) to British Legation, Paris. As British Air Representative, vice Grp/Capt. E. C. Grosvenor, C.M.G., D.S.O., 1/2.

Wing/Cmdr. F. H. Kirby, C.B., O.B.E., D.C.M., from H.Q., I.A., to No. 4 Stores Depot. Attached for course of instruction. 28/1.

F/Lt J. L. D. Cunningham, C.B.E., from R.A.F. Depot (I.A.) to Iraq Grp. H.Q. (M.E.A.). For Personnel Staff duties at Area H.Q. (on formation). 19/1.

S/Ldr F. A. Baldwin, from Air Ministry (Directorate of Equipment) to Iraq Grp. H.Q. (M.E.A.). For Stores duties at Aircraft Depot (on formation). 19/1.

S/Ldr A. J. Currie, from Record Office (I.A.) to No. 216 Sqn. (M.E.A.). (Super-numerary.) 21/1.

F/Lt D. Cloete, M.C., A.F.C., from Half-pay List to South African Air Force. (On secondment.) 21/2.

F/Lt C. R. Cox, A.F.C., from No. 5 Sqn. (India) to R.A.F. Depot (I.A.). (Super-numerary.) 27/12.

F/Lt R. B. Munday, D.S.C., from R.A.F. Depot (I.A.) to H.Q. C.A. 1/2.

F/Lt A. J. Braddon, from Iraq Grp. H.Q. (M.E.A.) to R.A.F. Depot (I.A.). (Super-numerary.) 9/1.

F/Lt F. Tedman, M.B.E., from Aircraft Depot, Egypt (M.E.A.) to R.A.F. Depot (I.A.). (Super-numerary.) 9/1.

F/Lt J. L. Duffus, from H.Q., M.E.A., to R.A.F. Depot (I.A.). (Super-numerary.) 9/1.

C/Lt A. C. Randall, D.F.C., from R.A.F. Base, Gosport (No. 210 Sqn.) (C.A.) to No. 203 Sqn. (I.A.). 19/1.

F/Lt F. W. Walker, D.S.C., A.F.C., from R.A.F. Base, Gosport (No. 210 Sqn.) to School of Naval Co-operation and Aerial Navigation (C.A.). 19/1.

F/Lt F. G. M. Williams, from R.A.F. Depot (I.A.) to No. 4 Stores Depot. For course of instruction. 28/1.

F/Lt F. J. Cooke, from No. 1 Stores Depot to No. 4 Stores Depot. For course of instruction, on ceasing to be attached to Port Detachment. 28/1.

F/Lt E. W. Crosbie, from School of Technical Training (men) (I.A.) to No. 4 Stores Depot. For course of instruction. 28/1.

F/Lt C. E. Richardson, from No. 6 Flying Training School (I.A.) to No. 70 Sqn. (M.E.A.). 10/1.

F/Lt T. G. Skeats, from R.A.F. Depot (I.A.) to Iraq Grp. H.Q. (M.E.A.). On ceasing to be attached to Air Ministry (Directorate of Equipment). 19/1.

F/Lt J. W. Woodhouse, D.S.O., M.C., from R.A.F. Depot (I.A.) to No. 1 Flying Training School (I.A.). 1/2.

F/Lt J. S. T. Fall, D.S.C., A.F.C., from No. 203 Sqn. (C.A.) to Marine and Armament Experimental Establishment (C.A.). (Super-numerary.) For training as Experimental Pilot. 7/2.

F/Lt C. P. Moore, from School of Naval Co-operation and Aerial Navigation (C.A.) to No. 216 Sqn. (M.E.A.). (Super-numerary.) 21/1.

F/Lt A. R. Mackenzie, from No. 1 School of Technical Training (H.Q.) (M.E.A.) to No. 216 Sqn. (M.E.A.). (Super-numerary.) 21/1.

F/Lt J. E. M. Atterley, from No. 1 Wing H.Q. (India) to R.A.F. Depot (I.A.). (Super-numerary.) 28/12.

F/Lt A. S. Goodwin, from H.Q., R.A.F., India, to R.A.F. Depot (I.A.). (Super-numerary.) 28/12.

### The R.38 Memorial.

The Secretary of the Royal Aeronautical Society intimates that the total amount subscribed to date towards the R.38 Memorial Research Fund is £1,200 os. 10d.

### R.A.F. SPORTS AND PASTIMES.

#### The Airship Officers' Club.

The annual dinner of the Airship Officers' Club will be held at 7.45 p.m. on Feb. 8th, at the Connaught Rooms, Great Queen Street. This date has been chosen to suit officers interested in the forthcoming Air Conference. Rear-Admiral Murray F. Sueter, C.B., M.P., will preside, and Mr. H. Ashbolt, the Agent-General for Tasmania, will be the guest of the evening.

Tickets, price £1 (exclusive of wines), may be obtained from the Hon. Sec., Major G. F. Herron, 98, Piccadilly, W.1, and extra tickets for guests can be had at 12s. 6d. each.

### Sports Board - February Fixture List.

Feb. 4th.—Rugby.—R.A.F. v. Royal Navy at Queen's Club. R.A.F. Rugby Union general meeting at 13.00 hrs.

Feb. 10th.—Fencing.—R.A.F. v. Birmingham Athletic Club, at Uxbridge.

Feb. 10th.—Association.—Semi-Finals Cup Competition at Uxbridge.

Feb. 15th.—Fencing.—R.A.F. v. Cambridge University, at Cambridge.

Feb. 15th.—Association.—Final Cup Competition, Uxbridge.

Feb. 18th.—Rugby.—R.A.F. v. United Services, Devonport, at Devonport.

Feb. 22nd.—Hockey.—R.A.F. v. Army, at Aldershot.

Feb. 22nd, 23rd.—Boxing.—Team Boxing Championships, at Cranwell.

Feb. 27th.—Hockey.—R.A.F. v. Cambridge University, at Cambridge.

### R.A.F. versus Llanelly.

RUGGER.—R.A.F. v. Llanelly. On Jan. 28th the R.A.F. journeyed to Llanelly, where apparently they met with the



same "hoodoo" that "hoodoo-ed" England three weeks ago, being soundly beaten by 16 points to 3.

In spite of the fact that the R.A.F. fifteen included three Internationals in F/Lts. C. N. Lowe, W. W. Wakefield and G. H. Maxwell, Llanelly held the advantage in forwards, and consequently their backs had many opportunities, and two goals were registered in the first half.

On changing over the home side continued to hold their own and two further unconverted tries were added to the score. Towards the end of the game F/Lt. C. N. Lowe made an opening for F/Lt. R. H. C. Usher, who scored the only try for the R.A.F.

The final score was Llanelly, 2 goals and 2 tries (16 points); R.A.F., 1 try (3 points)

#### Manston.

RUGGER (from the Manston point of view).—On Jan. 23rd at Uxbridge Manston played Uxbridge in the third round of the King's Cup Competition and were beaten by 1 goal 6 tries (23 points) to nil. For the first quarter of an hour play was fairly even and Manston were unlucky in not scoring. With the Uxbridge forwards then securing the ball the speed and combination of their backs enabled them to score three tries, one being converted.

The second half was a repetition of the first. Manston, though pressing on several occasions, were unable to score and the excellent Uxbridge three-quarter line scored four more tries. The combination of the Uxbridge right wing was very good, four tries being scored by it during the game.

The team was: F/O. McAlery; F/O. Hall, F/O. Hannay, F/Lt. Maxwell, F/Lt. Stammers; F/Lt. Brown, L/AC. Clayton; W/Cmdr. Landon, S/Ldr. Douglas, F/Lt. Turner, F/O. Ritchie, F/Lt. Booth, F/O. Saunders, S/M. Beattie, AC. Ross.

#### Uxbridge.

RUGGER (from the Uxbridge point of view).—On Jan. 23rd Uxbridge met Manston in the third round of the R.A.F. Rugby Cup on the Depot ground. As expected a good hard game ensued. At the start the visitors pressed and play was in the home half. Once or twice Uxbridge relieved but fine kicking by the Manston threes sent them back.

Eventually however the home forwards found their feet and play was transferred to the visitors' 25, where after a quarter of an hour's play good work by F/Lt. W. W. Wakefield and F/Lt. J. Russell in the centre enabled S/M. Bradbury to cross over far out on the right. The extra points were not added. The home team maintained the pressure and before half-time S/M. Bradbury crossed again, while a fine solo effort by F/O. J. K. Smith ended in F/O. Macdonald scoring between the posts. F/Lt. Lees added the extra points and Uxbridge crossed over leading by 11 points to nil.

In the second half the home threes indulged in some fine passing and F/Lt. Wakefield twice sent over F/O. Storr, wide out on the left, while on the other wing F/Lt. Russell and S/M. Bradbury each registered a further try.

In the closing stages the visiting forwards strove manfully to open their account, but without success. The final score read: Uxbridge, 1 goal 6 tries; Manston, nil.

For Manston F/Lt. E. F. Turner led his pack well and the centre threes did some good touch-finding, but their combination was not so good. For the home team, all the threes showed fine pace and combination, and were ably fed by F/O. Smith at flyhalf, while AC.2 Wood again proved sound as full-back.

Home team.—AC.2 Wood; S/M. Bradbury, F/Lt. J. Russell, F/Lt. W. W. Wakefield, F/O. H. H. Storr; F/O. J. K. Smith, F/O. Clayton; F/Lts. Lees, Balfour, Todd, F/Os. Macdonald, Davey, Vasse, Sit. Stephens and AC.2 Gidding.

SOCCER.—At Uxbridge on Jan 21st in the Middlesex Senior Cup R.A.F. Depot beat Wealdstone by 3 goals to 2. Despite the heavy state of the ground some fast and clever football was witnessed in this match.

HOCKEY.—At Uxbridge, Jan. 21st, R.A.F. Depot 9, St. Barts. 1. In justice to the students it must be noted that they were unable to put a full team in the field.

#### The Woodpeckers' Reunion Dinner.

The Reunion Meeting of the Catterick Aerodrome Woodpeckers' Association will be held at the Waldorf Hotel on Saturday, Feb. 4th, at 7.30 p.m. Major C. Y. McDonald will be in the chair. Further information from F/O. L. J. Riordan, Uxbridge.

#### Martlesham Heath Reunion.

The second annual reunion dinner of the Aeroplane Experimental Establishment, Martlesham Heath, was held at the Café Royal, Regent Street, London, on Friday, January 20th, last, Brig.-Gen. R. K. Bagnall-Wild, C.M.G., C.B.E. (Director of Research), being in the Chair. A good number of past and present Martleshamites attended, and after some preliminary research work about "fuels" and "lubricants" further research work was carried out with "solids."

The Chairman having proposed The King and later the R.A.F., Major Barlow proposed "Past Members." He referred generally to the work of the Station, and to the in-

creased dangers to groundlings there, due to the activities of the experimental parachute section. He also pointed out the dangers they ran of being killed in their sleep. Major David Geddes (no relative of the axe-wielder) was to have replied to this toast, but went into a flat spiu owing to shyness, and Squadron Leader Vernon Brown finished the reply. The latter speaker also had to propose "Present Members," during which he outlined the early developments of the present testing station. S/Ldr. Maund, the present C.O., replied briefly.

Major R. H. Mayo proposed "The Director of Research," and in the course of his speech referred to English and French methods of testing, and mentioned what a high opinion the



French had of Martlesham. The Chairman in his reply spoke hopefully of the future and told many amusing anecdotes, the poem on "Moonlight" being greatly appreciated.

The Chairman then called on Wallocks, who is Martlesham's tame pianist (portrait of said gentleman on the Menu), who led off with the Station's favourite song, "O death where is thy sting." S/Ldr. Vernon Brown contributed excellent songs.

When the ambulances arrived everybody was sorry it was all over, and as the L.C.C. were not allowed to put us to bed early, we proceeded in various directions to spend the evening. In this direction we should like answers to the following questions:

- (i) Who was walked up and down Regent Street to get fresh air?
- (ii) Who was the Captain who tried to catch birds with a handful of sugar?
- (iii) What happened to Prunty?
- (iv) How much Bowser made out of the adverts, he wrote on the menus?
- (v) Who spent several hours of the early morning trying to find Robby—and where was he?

#### AN AIR HOUSE AFFAIR.

An Aircraft Dance will be held on Wednesday, March 1st, at the Suffolk Galleries, Pall Mall, S.W. The net profit, if any, is to be handed to the R.A.F. Memorial Fund. Dancing will proceed from 10.30 on March 1st to 02.00 on March 2nd. Light refreshments will be provided for the inclusive sum of 8s. 6d. Fancy or ordinary dress may be worn. It is hoped that everybody in the Aircraft community will attend so as to make the profits for the R.A.F. Fund as large as possible. Tickets may be obtained from A. S. Winks, Esq., Room 736, Alexandra House, Air Ministry, Kingsway, W.C.2, or applicants for tickets may phone Mr. Winks at Regent 6700 Ext. 176.

#### NAPIERS FOR FOKKERS.

It is of great interest to note that Mr. Fokker has placed an order for some Napier "Lion" engines. It is presumed that this engine is for the 12-seater which has previously had a



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plan central et la queue, etc., sont  
de type normal, et sont construits  
de manière à pouvoir recevoir des  
ailes de types différents, ainsi que  
des châssis et moteurs d'autres  
machines de la série, de manière  
à être appropriés à l'usage auquel  
la machine est destinée dans  
chaque cas particulier. Toutes les  
machines de cette série ont des  
ailes démontables et repliables et  
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breveté de cambrure variable, qui  
permet les plus grandes perfor-  
mances et qui combine une grande  
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fabricados para adaptarse a di-  
ferentes tipos de alas, chassis y  
motores de otros aparatos de serie  
que sean adecuadas para los fines  
particulares a que se destina el  
aparato en cada caso. Todas  
las máquinas de este tipo,  
tienen alas plegadizas y están  
provistas del dispositivo patentado  
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### THE WEEKLY COMMENTARY.

The first of a series of articles, wherein the Commercial Aeroplane as it is and as it may be is to be discussed appears below. In this article the present deficiencies of the existing type of aircraft are discussed and the vital need for radical improvement in aerodynamic and structural design is emphasised.

In later articles the conditions which hamper rapid development and have led to the present stagnation in design are discussed, and, finally, some of the possible methods by which really great improvements can be achieved will be outlined.

In this issue there will be found a note concerning the care, maintenance and calibration of the standard type of air-speed indicator which is used on all British aircraft. This note should enable any intelligent pilot or ground engineer to maintain this particular instrument in sound working order and correct calibration.

Space and other considerations allowing, a series of such articles dealing in a practical manner with the whole instrumental equipment of the aeroplane will follow this article.

### THE COMMERCIAL AEROPLANE.

By W. H. SAYERS.

#### 1. Its Present Deficiencies.

The War has now been ended for over three years, and the aeronautical world has had that space wherein to investigate the possibilities of using aircraft—as the War had made them—for more or less useful peaceful purposes, and it is certainly now possible to come to certain fairly definite conclusions concerning the results of those investigations.

The work of the past few years has been spread over a fairly wide field. It has embraced joy-riding pure and simple, the use of aircraft for survey and prospecting purposes in sparsely and in densely populated districts, and the operation of regular air lines between various centres of population.

#### WHAT AEROPLANES OF TO-DAY CAN DO.

It has shown that aeroplanes as they are to-day, if they are firstly decently built, secondly decently maintained, and finally flown by competent and careful pilots are distinctly more safe and reliable and have a considerably longer useful life than was generally suspected at the end of the War.

It has shown that even the trying and uncertain climate of Britain interferes with the regular operation of aircraft to a very much less extent than would have been expected, even in the absence of all but the most elementary route organisations, and that the development of adequate navigational and alighting facilities even for cases of dense fog are not at all impossible or even improbable.

And equally the doings of civil aircraft have demonstrated to those who can see behind the obscuring screen of short-sighted management that the aeroplane can perform services to civilised mankind which are beyond the capacity of any other known form of transport.

#### AND WHAT IT CANNOT DO.

And finally it has been shown that the existing type of aeroplane costs too much to build, to run and to maintain, and affords to its passengers too few comforts and too many positive discomforts for the aeroplane to compete with other forms of passenger vehicle on regular lines of communication.

It has not been shown definitely that the present type of aeroplane is incapable of carrying express mails at a cost which can be borne by that type of traffic, but, with a Government department holding a monopoly of this type of traffic it is almost certainly impossible—in this and the adjoining countries at least—to discover what an air mail service can do if properly organised and managed.

No serious attempt has ever been made to investigate the commercial possibilities of the existing type of aircraft over routes of the type which should offer the very best chances of immediate profitable operation, in fact so far as is known in Britain only one seaplane service has ever been operated, despite the enormous number of available routes. That service was not operated for a sufficiently long period to have given

any useful commercial data, but has doubtless given its promoters a fair amount of valuable data as to costs.

A further fact which has nothing to do with aircraft themselves, but which has a very vital bearing on their future, is that it would appear to be impossible to interest any present-day financial magnates to put capital into the aerial development of routes wherein existing means of transport give poor facilities, and on which existing traffic is small.

Until this country possesses an efficient and alert Post Office the mail business cannot be looked to for salvation. Passengers are the only other form of traffic habitually in a hurry, and it is to them that the aeroplane must look for its immediate future, and as has been shown there is no future to be sought in this direction until the cost of aerial transport has been very greatly reduced.

#### WHAT COMMERCIAL AIRCRAFT COST.

Despite three years of experience there are at present no reliable data as to the actual costs of operating a regular air service with present-day aircraft. A detailed estimate for a large number of different machines was presented to the Guildhall Air Conference of 1921 by Sir Henry White-Smith, but estimates are not entirely trustworthy guides. Col. Searle's statement that the defunct Air Transport and Travel Ltd.'s service was just paying during the latter part of the Summer of 1920 seems more or less to confirm these estimates, and to show that with machines of the type now actually in service the total cost per seat, for transport from London to Paris is in the neighbourhood of £5.

That is to say that, with the 120 fare of £10 per passenger the average load carried had to be 80 per cent. of the machine capacity to cover all costs, and that at the present fare of £6 6s.—neglecting subsidies—a load factor of 80 per cent. is needed to clear expenses.

#### WHERE THE MONEY GOES.

Taking machines now operating it is not particularly difficult to make some sort of estimate of the running costs. Running costs include petrol, oil, wages of crew, and repairs and maintenance. The latter is a conjectural item, the others are fairly ascertainable. The petrol consumption of an eight-seater 450-h.p. machine in actual service averages 24 gallons per hour—60 gallons for the London-Paris trip, which at the convenient round figure of 3s. per gallon totals £9. The oil consumption can scarcely exceed 10 gallons per trip, which even at 7s. 6d. per gallon amounts to £3 15s.

The cost of pilots is at the moment high, not because they are unduly highly paid, but because, under present conditions they do very little work. A total income of £750 per annum for 300 trips per annum puts the cost of pilot at £2 10s. per trip. That is, the total running cost apart from maintenance should not exceed £15 5s. per trip.







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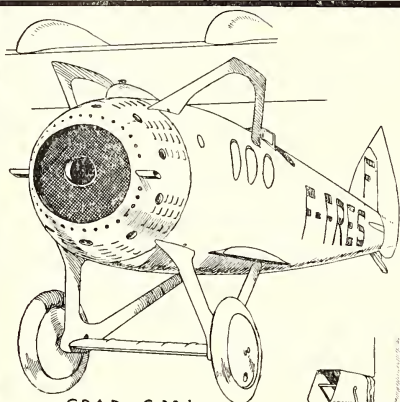
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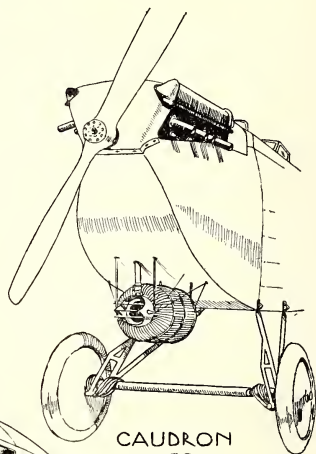
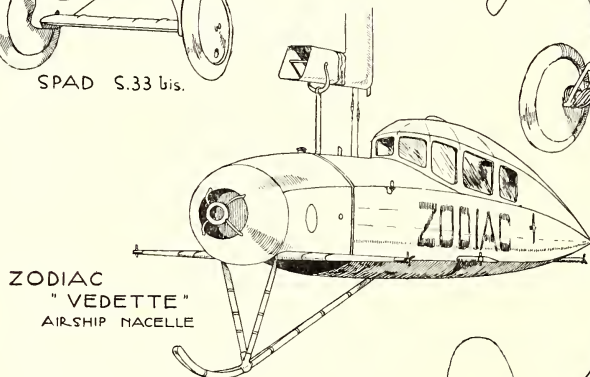
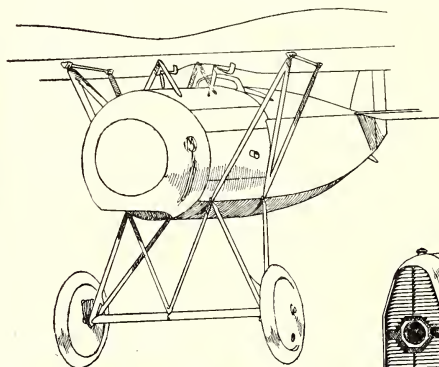
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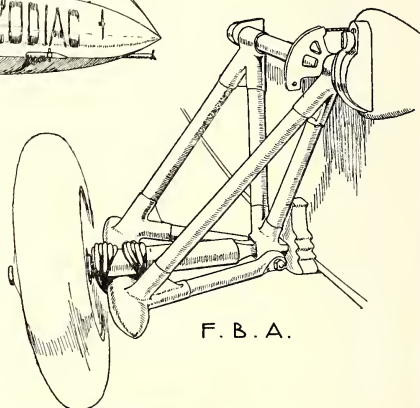
## AIRCRAFT DETAILS FROM THE PARIS SHOW (PLATE IX).



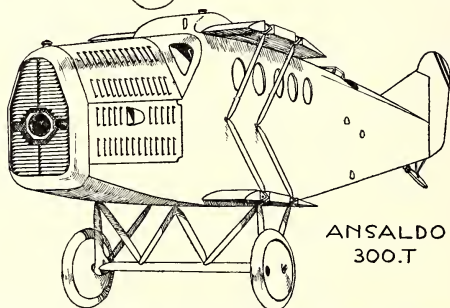
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C.59.ZODIAC  
"VEDETTE"  
AIRSHIP MACELLE

MORANE-SAULNIER A.U.



F. B. A.

ANSALDO  
300.TEDWARD  
BRIDGMAN  
PARIS. '21.

[Of course this plate should have been published weeks ago, but as numerous events of urgent importance have had to be discussed and as the amount of editorial space available depends directly on the number of advertisements each week, there has not hitherto been a page available on which to print it.—Ed.]

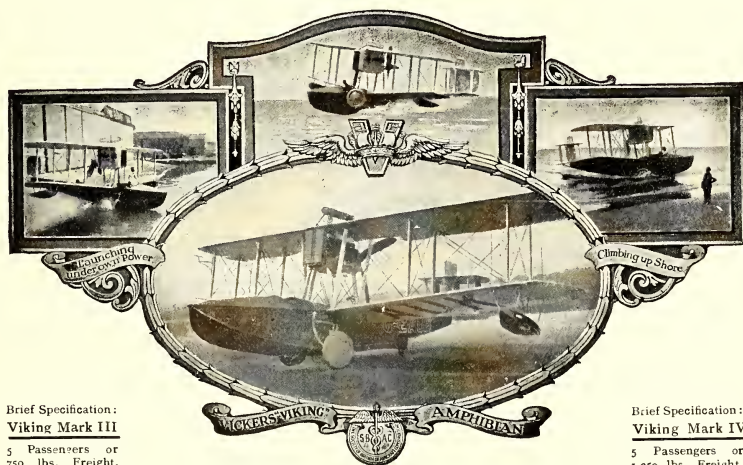


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##### Viking Mark III

5 Passengers or  
750 lbs. Freight.

RANGE : 480 miles.  
SPAN : 46' 0"  
HEIGHT : 15' 1"  
LENGTH : 33' 5"

The Vickers Viking was classified **FIRST** in the following competitions at the **INTERNATIONAL SEAPLANE COMPETITIONS** at **ANTWERP, July 1920**

1. Shortest time in "unsticking" from water.
2. Fastest time over a given circuit.
3. Climb to 1,000 metres.
4. Altitude with full load

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**NEWCASTLE :** Commercial Union  
Buildings, Pilgrim Street.  
**GLASGOW :** Vickers House, 247,  
West George Street.  
**BRISTOL :** 55, Park Street.  
**NORWICH :** 16, White Lion Street.  
**BELFAST :** 26A, Arthur Street.  
**LEEDS :** Greek Street Chambers,  
Park Row.

#### Brief Specification :

##### Viking Mark IV

5 Passengers or  
1,250 lbs. Freight.

RANGE : 480 miles.  
SPAN : 50' 0"  
HEIGHT : 15' 1"  
LENGTH : 35' 0"

The Vickers Viking was the winner of the **FIRST** prize of £10,000 for the **Amphibian Class** of Aircraft entered for the **BRITISH AIR MINISTRY COMPETITION**, **September, 1920**

Aviation Department,  
**VICKERS HOUSE, BROADWAY, LONDON, S.W.1.**

## PRACTICAL HINTS ON AIRCRAFT INSTRUMENTS.

By A. W. HULBERT.

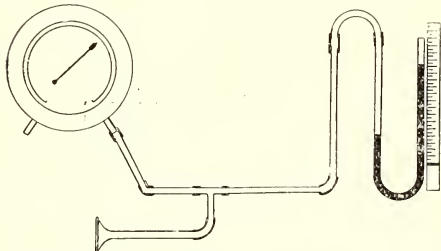
### AIRSPEED INDICATORS

There is a pretty general idea that once an air-speed indicator has been calibrated by the makers to give an accurate indication of the airspeed of the machine it will continue to do so indefinitely.

Unfortunately this is not so, and the readings of all the airspeed indicators in use should be checked, say, once a month with the aid of the apparatus described below.

#### TESTING PLANT.

This consists of a glass "U" tube about 20 inches long and with a bore of not less than  $\frac{1}{4}$  in., as shown in the sketch. The tube must be mounted in an upright position on the wall with metal clips. One end of the tube is left open, the other being connected to the nozzle marked "P" or "pressure" on the instrument under test. A metal "T" piece is introduced into the system as shown, a short length of rubber tubing fitted with a mouthpiece being connected to the third arm of the "T" piece.



A scale is now required in accordance with the figures given below and should be fitted at the side of the "U" tube as shown in the illustration.

#### CALIBRATION SCALE.

MM. of water pressure.	Equivalent reading of Airspeed Indicator in M.P.H.
1.2	10
5.0	20
11.2	30
19.9	40
31.1	50
44.8	60
61.0	70
79.5	80
100.7	90
124.3	100
179.0	120
216.0	130
244.0	140
297.0	150

To test an airspeed indicator, it should be connected up as shown in the sketch. Fill "U" tube with water up to zero mark and blow into mouthpiece until the water is displaced to a certain point on the scale. For example, if the water in tube open to the air stands at 61 mm. the instrument itself should be reading 70 m.p.h. If the instrument is reading, say, 10 per cent. high all round the scale, the error can be rectified by shifting the pointer slightly on the spindle.

As all British instruments are calibrated for use with the standard R.A.F. pitot tube they can all be tested with the apparatus described above, quite irrespective of the actual make of instrument.

#### POINTS ON INSTALLATION.

The greatest care must be exercised to ensure that all rubber joints in the tubing between the instrument and the pitot head are absolutely free from leaks, as a leak, however small, will cause the indicator to read low. The rubber joints should be replaced periodically. With regard to the pitot tube, never attempt to clean it with an oily rag. A certain amount of oil is sure to find its way up the open "pressure" tube and will collect dust, clogging the tube and causing the indicator to fail.

Make sure in fitting the pitot tube that it is well out of the slip-stream from the aircrew.

The best position is 15 inches from the top of the outer interplane strut, and both tubes must be pointing dead straight in the line of flight of the machine.

## MIDLAND SUCCESS.

It is interesting to record that the Midland Motor Cylinder Co. Ltd., Dartmouth Road Foundries, Smethwick, are amongst those firms who report signs of increasing demand and are optimistic regarding an early lifting of the trade depression. The opportunity has not been lost of ensuring a completely efficient organisation for the return to normal business conditions.

To enable a continuance of the individual and personal attention given the firm's customers, and to strengthen the Sales and Service Department, Mr. L. O. Smith, for many years with Alfred Herbert Ltd. of Coventry and more recently with Dennis Bros. Ltd. and S. Smith and Sons (M.A.) Ltd., has been appointed Sales Manager and personal assistant to Mr. Arnold E. Pearce, the Joint Managing Director.

The M.C.C. Co. has recently produced a booklet which is bound to be of interest to all firms who are concerned with cast metal of any kind. The booklet is entitled "What America thinks of Midland Cylinders," and it contains a reprint of a leading article from that well-known American journal, *The Foundry*, in which the organisation work and workmanship of the M.M.C. Co. is held up as an example to even the most up-to-date American foundries.

It is to be hoped that the recent recuperation of trade at the M.C.C. Co.'s foundry is only a sign of the firm reaping the reward of the enterprise it showed and the good work it did during the war.

## THE INTERNATIONAL AIR TRAFFIC ASSOCIATION.

At various times paragraphs have appeared in the Press referring to the operations, either intended or active, of an organisation called The International Air-Traffic Association Ltd. Very little is known about this association and therefore it seems well to record the constitution of the association.

At present the membership is as follows:—  
Danske Luftfartsselskab, Amalgade 27b, Copenhagen, Denmark.

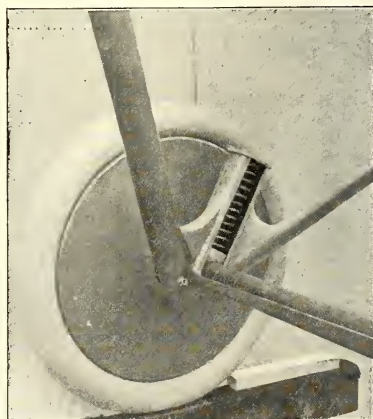
Finska Lufttrafik Aktiebolaget, L3 Skillnad, Helsingfors, Finland.

Danziger Luftreederei, 6 Elisabethwall, Danzig, Germany.  
Svenska Lufttrafik Aktiebolaget, 7 Kungsgaten, Stockholm, Sweden.

Deutsche Luftreederei, 4 Sommerstrasse, Berlin, Germany.  
Koninklijke Nederlandsche Luchvaartmaatschappij, 13 Heeregracht, The Hague, Holland.

All the above companies were represented at a meeting held at Stockholm recently.

The association was founded on Aug. 26th, 1919. Its objects are the establishment of unity in the exploitation of air lines in which the territories of two or more States are concerned. The independence of the members is absolutely respected. In the beginning of February, 1922, a meeting of the Association will be held at The Hague and probably other companies will join the association.



**RUBBERLESS SHOCK ABSORBER.**—A German War-time undercarriage with steel spring shock absorber. Despite the superior bounce-deadening effect of rubber, this steel spring arrangement is undoubtedly a cleaner and neater job than the usual "Sandow" installation.

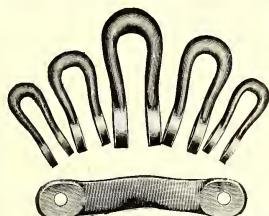
## AN APPRECIATION OF THE DH9c.

The following is an extract from a letter recently received from the Compañía Española de Tráfico Aéreo—the Spanish aerial transport company which is running the Seville-Larache Air Line:—

“On the occasion of the completion of the first three months during which we have been operating the first Spanish air service between Sevilla and Larache, we should like to take the opportunity to place on record our satisfaction with the material and personnel provided by you. Using these exclusively, you will be pleased to hear that we have, since the inauguration of our service on October 15th, 1921, till January 15th, 1922, successfully completed 85 return journeys. This represents 42,500 kilometres covered without difficulty or mishap and an incalculable saving in time and increase in regularity over the existing means of transport.”

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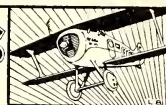
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# COMMERCIAL AERONAUTICS

## AND CIVIL AERIAL TRANSPORT.



### THE UNITED KINGDOM OF GREAT BRITAIN AND IRELAND.

#### CONTINENTAL ARRIVALS AND DEPARTURES.

[The following table of arrivals at and departures from the British Air Ports is compiled on the following system:—First comes the initials of the Air Line; next the type of machine; next the international number of the machine; next the ports of departure and destination; next the times of departure and arrival; next the cargo, whether goods (G) and/or mails (M); next the number of passengers; and finally the name of the pilot and number of mechanics, if any.]

ABBREVIATIONS:—A.D.—Aircraft Disposal Co. B.A.—Berkshire Aviation Co. B.C.—Bristol Aeroplane Co. B.M.—Brompton Motor Co. C.A.—Department of Civil Aviation. D.H.—De Havilland Aircraft Co. G.E.—Compagnie des Grands Express Aériens. H.P.—Handley Page Transport Ltd. I.L.—Instone Air Line K.L.—Koninklijke Luchtvaart Maatschappij. L.A.—Leatherhead Aviation Services. M.A.—Messageries Aériennes. M.W.—Marconi Wireless Telegraph Co. Ltd. P.O.—Private owned. P.L.—Peters Ltd. S.F.—Surrey Flying Services. S.N.—Syndicat National pour l'Etude des Transports Aériens (S.N.E.T.A.).

#### The London Terminal Aerodrome, Croydon. (Telephone: Croydon 2720.)

##### JANUARY 23rd:

NIL.

##### JANUARY 24th:

NIL.

##### JANUARY 25th:

NIL.

##### JANUARY 26th:

NIL.

##### JANUARY 27th:

NIL.

##### JANUARY 28th:

A.D.C. Snipe, G-EBBE, London-Brussels, 12.00—, Nil, Nil, Haynes  
A.D.C. DH9, G-EAWO, London-Brussels, 12.20—, Nil, Nil, Stocken.  
I.L., DH18, G-EAWO, London-Paris, 12.13-15.30, G.M., 4, Robins & 1.  
A.D.C. Bristol, G-EBAT, London-Brussels, 12.25—, Nil, Nil, Elton.  
A.D.C. DH9, G-EHAN, London-Brussels, 12.30—, Nil, Nil, Heric.  
H.P., HP, G-EATH, London-Paris, 12.35-10.15, G.M., 7, Rogers & 1.  
G.E., Goliath, F-GEAO, London-Paris, 12.40-16.00, G., 1, Mire & 1.  
A.D.C. Bristol, G-EBBD, London-Brussels, 13.31—, Nil, Nil, Muir.

G.E., Goliath, F-GEAD, Paris-London, 12.15-15.30, G., 3, Gastoux & 1.  
I.L., Vimy, G-EASI, Paris-London, 12.35-14.55, G., Nil, Powell & 1.  
M.A., Spad, F-ACM, Paris-London, 13.10-15.28, G.M., Nil, Le Men.

##### JANUARY 29th:

I.L., DH18, G-EAWO, London-Paris, 12.03-15.00, Nil, 8, Powell & 1.  
I.L., DH18, G-EAWO, Paris-London, 12.20-14.35, Nil, 7, Robins & 1.

#### Inland Flying at Croydon.

Jan. 23rd.—I.L., DH18 test (Barnard).

Jan. 24th and 25th.—Nil.

Jan. 26th.—G.E., Goliath test (Mire); I.L., DH18 (Holmes); M.A., Spad (Challoux); both latter started for Paris, but put back.

Jan. 27th.—Nil.

Jan. 28th.—M.W., Avro tests (Shaw); I.L., DH18 test (Barnard); R.Ae.C., Avro, R.Ae.C. certificate (Vincent).

Jan. 29th.—R.Ae.C., Avro Joyride; B.E.c Joyrides (Vincent).

#### Cross-Channel Statistics.

Week ending January 29th:—

Machines, 151; Passengers, 30; Crews, 20; Total Personnel, 50

Corresponding week last year:—

Machines, 155; Passengers, 51; Crews, 17; Total Personnel, 22

#### The London Terminal Aerodrome.

The past week has been the worst on record. From Thursday of the previous week to Saturday of this week no machines ran on the Continental service whatsoever owing to fog, rain and low clouds.

The outstanding event of the week was the swinging of a compass for the Instone Air Line.

Previous to Saturday practically all the flying was done by the Aircraft Disposal Company. On Thursday various of their machines were reported in the air, the pilots including Mr. Haynes on a "Snipe" and later on Mr. Perry on a D.H.9a (Rolls-Royce), who was doing speed tests in a thick fog.

Earlier in the day Mr. Holmes on a D.H.18 started off to Paris, but the weather was so bad that he returned after a few minutes. At the same time a "Goliath" went up for a test and a Spad also started off to Paris. The Spad returned, however, and made a "split-air" S turn with flat turns into the aerodrome and pecked, breaking a V of his undercarriage.

Saturday was a great day from a flying point of view. First of all Mr. Haynes was performing well on an A.D.C. "Snipe." Then a Bristol came over from Kenley way and after some comic "Noakes-like" flying finished up with about eight or ten loops, the last of which was sensationally low.

Mr. Shaw then took the air on the Renault-Avro and Mr. Holmes on a D.H.18 and Mr. Rogers on an O/400 went off to Paris as did a "Goliath."

After this Mr. M. Vincent, a Cranwell cadet, took his R.Ae.C. "ticket" on an Avro, observed by Mr. Perrin. He took his ticket in fine style (as they used to say in pre-war days), making his landing within a few feet of the mark, which was the "C" in "Croydon." He went to a height of 8,500 in the course of his last flight. This is the first "ticket" taken at Croydon since its formation as the L.T.A.

While Mr. Vincent was performing various machines set off for Brussels. Mr. Forrester-Walker on a Bristol took off and when about forty feet or so up his engine cut out. The machine stalled, turned over sideways and nose-dived into the ground. The machine seemed to bounce along on her nose like a pogo and finished up the other side of the new Brighton road, the machine being smashed to atoms. The pilot was thrown out and escaped practically unhurt, the only damage being some cuts on one leg and a somewhat damaged suit.

Mr. Forrester-Walker says that he took off on the gravity tank and that when he pulled the machine up on a sharp climbing turn the engine conked through lack of petrol. He kicked on his rudder and so brought her over sideways onto a wing instead of doing a straight stall. Which was probably what saved his life.

The incident was a tragedy of disappointment for the ambulance man, who started out (for the first time in two years) full of hope and came back in despair after a fruitless journey.

A few seconds after the crash Mr. Muir took off immediately over him on the Bristol for the Queen of the Belgians. This machine was forced to return to Croydon after it started some ten days ago, as Mr. Muir did not wish to risk having to land it in an open field where its smart appearance might be ruined by weather.

The next event was the arrival of Mr. George Powell on the "Vimy" from Paris. He left the aerodrome some ten days previously and has been detained by weather and "flu."

A Goliath and a Spad arrived soon after.

Earlier in the day a curious-looking machine passed the aerodrome away to the North, making in the direction of Brooklands. It seemed to be of Vickers origin.

By the time these notes appear the O/400 with Bristol "Jupiter" engines should be at the aerodrome, Mr. Olley having gone to Bristol over the week-end to fetch it.

# INSTONE AIR LINE

51, LEADENHALL STREET, E.C.4, and  
LONDON TERMINAL AERODROME, CROYDON.

Telephone: AVENUE 3616.

Mr. Wigglesworth has been at the aerodrome during the week. He is in charge of Count Zborowski's aerial activities. He tells one that he has a couple of B.E.2ds to sell quite cheaply and he also has an S.E.5, which he has converted for a 70-h.p. Renault engine. He has successfully flown this interesting conversion at the Bekesworth aerodrome near Canterbury.

The aerodrome lighthouse has ceased to operate and is being moved, meanwhile the cone light fulfils the functions of the former.

It is understood that Col. Searle's air line will begin operations on April 3rd, and that he will use six D.H.34 (Napier). At first he will run two machines per day each way and later he hopes to run four, probably about May. It is said and hoped at the aerodrome that Mr. Hinchcliffe is to be his chief pilot.—G. D.

#### Things People Would Like to Know.

What is known as the Palestine Navy?

Who is known as "Count Vodka"?

If Elizabeth is still leaning out of the window looking for the Bristol?

The Cardinal's (As you were—the Colonel's) chances in the forthcoming Papal election?

What Mr. Forester-Walker said?

What Mr. Godfrey Isaac said?

Who is the Gentile firm on the aerodrome? (If none please fill in the word "Nil.")

What will be the rank badge on "Brown's" uniform?

Whether a certain air line find water cheaper than petrol?

What "Sammy" Hall said because he missed the crash?

And what he thinks of water as a fuel?

Why pork appears in the menu on such inopportune occasions?

Which air line carried the pigs?

And how many felt compelled to refuse the job?

Why so many people looked so pale and the very opposite of "Cole-black" on Saturday morning?

Whether cotton waste is considered to be an efficient substitute for other lubricants?

When the "Aerial Darby" will next be seen at Croydon?

How Col. Searle is going to fill up his machines while turning them round?

Who comprise the various "political groups" on the aerodrome?

Why the leader of the "Independent" group does not wear a top hat?

Where do lighthouses go in the Summer time?

Are fur topped and sided boots included in the uniform and are they subsidised?

Vy de shentleman who said dat he vould de vence down 'ave 'as nod yet de vence down 'ad?

Whether the pilot told the firm he would test the machine for 5s. and third class expenses?

Whether they beat *that* down?

#### AIR RACES IN 1922.

The Race Committee of the Royal Aero Club has decided, subject to the consent of the Air Council, to hold Aviation Race Meetings at the London Aerodrome, Croydon, on the following dates:—

Easter Monday, April 17th, 1922.

Whit Monday, June 5th, 1922.

August Bank Holiday, August 7th, 1922.

A further Race Meeting will be held in September or October and will be announced later.

The Race Meeting on Easter Monday will be similar to the First Croydon Meeting in September last and particulars will be available shortly.

The Aerial Derby and presumably the R.A.F. Pageant will also be held at Croydon.

#### PERSONAL NOTICES.

##### DEATH.

FENTON.—On Jan. 21st, 1922, of a malady contracted while a Prisoner of War in Germany, Cyril Fenton, late Lieut., R.F.C., eldest son of George Fenton, of Carlton, Victoria.

##### ENGAGEMENT.

NICOLI.—LANGHAM.—The engagement is announced between F/Lt. R. E. Nicoli, R.A.F., youngest son of the Rev. C. A. S. and Mrs. Nicoli, of St. Leonards-on-Sea, and Dulcie, daughter of Colonel F. G. Langham, C.M.G., and Mrs. Langham, of Hastings.

##### MARRIAGE.

MCALERY.—SCOTT-HOLMES.—On Jan. 27th F/O. John Macredy McAlery, R.A.F., only son of the late Rev. John McAlery, of Co. Antrim, and Mrs. J. O. Campbell, Mayallon, Annadale, Belfast, and Cecily Mary Scott-Holmes (late Deputy Administrator, W.R.A.F.), elder daughter of Mr. and Mrs. Scott-Holmes, of Norwich, and granddaughter of the late Major H. T. Holmes, of Wacton House, Norfolk.

##### BIRTHS.

LONGMORE.—On Jan. 26th, at Ebsenwood, Camberley, wife of Gp/Capt. A. M. Longmore, D.S.O., R.A.F.—a son.

RENNIE.—On Jan. 24th, at Bognor, Phyllis, wife of Major J. D. Rennie (late R.A.F.)—a son.

SAVERS.—On Jan. 24th, at 9, Sydenham Park Mansions, Sydenham, to the wife of Capt. W. H. Savers, late R.A.F.—a daughter.

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Accles & Pollock, Ltd. ... .. 91	De Havilland Aircraft Co., Ltd., The... .. 89	Rolls-Royce, Ltd. ... .. 85
Bray, Gibb & Co., Ltd. ... .. <i>Front Cover</i>	Fairey Aviation Co., Ltd., The ... .. 81	Rubery, Owen & Co. ... .. 89
Aircraft Disposal Co., Ltd. ... .. <i>Back Cover</i>	Goffree, E., & Co. ... .. 91	Tait-Cox and James ... .. 92
Brown Brothers, Ltd. ... .. 89	Godstone Air Line ... .. 90	Titanium, Ltd. ... .. <i>Front Cover &amp; 82</i>
Bristol Aeroplane Co., Ltd. ... .. <i>Back Cover</i>	Palmer Tyre, Ltd. ... .. <i>Inside Back Cover</i>	Vickers, Ltd.... ... .. 87
Cunard Line ... .. 92	Roe, A. V., & Co., Ltd. ... .. <i>Inside Front Cover</i>	

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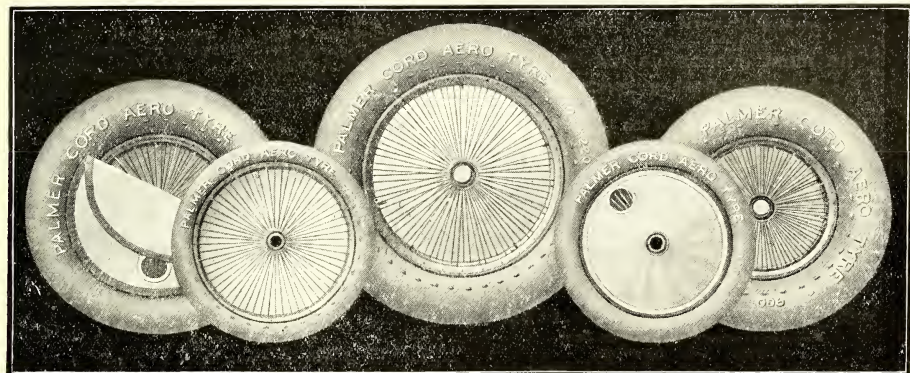
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		72.39	12.7	Central	"	112	178.	38.89	132/46	"	149	185.	60.32	Central
450 × 60	30	89.	31.75	Central	"		150.	38.09	Central	1000 × 180	148	220.	80.	Central
"	138	130.	38.09	Central	650 × 125	119	178.	55.	132/46	"	149	185.	55.	Central
										"	155	220.	66.67	Central
575 × 60	21	160.	28.	Central	750 × 125	77	178.	44.45	132/46	900 × 200	107	185.	55.	Central
"	34	150.	31.75	104/46	"	92	185.	55.	135/50	"	108	185.	55.	125/60
"	111	150.	38.09	104/46	"	95	185.	55.	Central	"	128	220.	66.67	Central
					"	96	178.	55.	132/46	"	137	250.	80.	Central
600 × 75	21	160.	28.	Central	"	99	178.	38.89	132/46	"	202	185.	60.32	Central
"	34	150.	31.75	104/46	"	112	150.	38.09	Central					
"	111	150.	38.09	104/46						1100 × 220	134	220.	66.67	Central
					800 × 150	82	185.	55.	135/50	"	136	250.	80.	Central
700 × 75	78	178.	44.45	132/46	"	85	185.	55.	Central					
"	79	178.	44.45	Central	"	40	185.	60.32	135/50	1250 × 250	133	250.	80.	Central
"	100	178.	38.09	132/46	"	152	185.	66.67	135/50	"	154	304.8	101.6	Central
"	101	178.	31.75	132/46										
700 × 100	77	178.	44.45	132/46	1000 × 150	131	220.	66.67	Central	1500 × 300	115	304.8	101.6	Central
"	92	185.	55	135/50	"	102	185.	55.	125/60	"	126	304.8	152.4	Central
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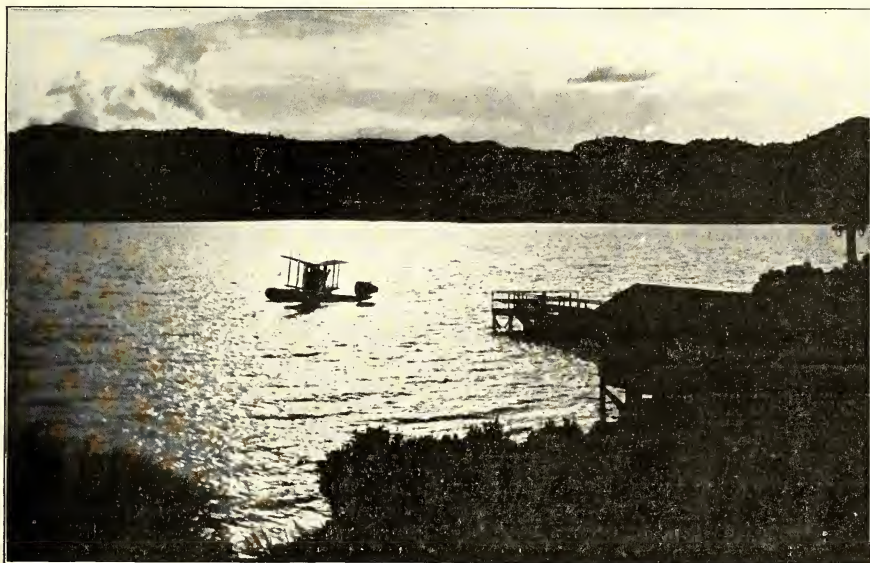
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Vol. XXII. No. 6.

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## DAWN.



WHANGAROA HARBOUR, NEW ZEALAND.—A Supermarine Flying Boat is here seen putting out from the Slipway for an early morning flight.

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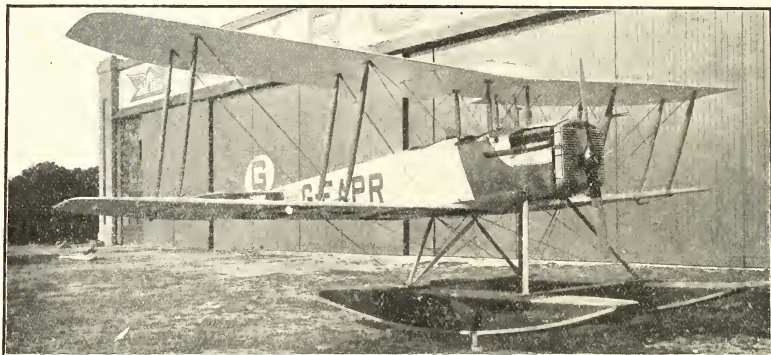
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## ON EFFICIENCY AND ECONOMY.

Whatever may be the effect of the Air Conference which has just finished, whether the Great British Public has been enthused thereby, whether those from other industries and interests who were invited to the Conference have been inspired with a pure faith in aerial transport, whether those who are already concerned with aviation have learned much or little from the lectures and the consequent discussions, whether the Air Ministry has been instructed in the way it should go, or whether the whole thing has been simply a wash-out, the Air Ministry is faced with two problems. These are how to economise on its expenditure and how to get the best results out of what money has been allotted to it in the Estimates which will be issued in the course of the next few weeks.

Unfortunately owing to the fact that the Air Conference begins on the day (Tuesday) on which this issue of THE AEROPLANE goes to press it is impossible to deal with the Conference itself. One can only say that, judging by the previously issued synopses of the various papers read thereat, those who have attended the Conference have heard much of interest. But they could have heard as much and more by attending regularly the fortnightly meetings of the Royal Aeronautical Society. In fact the only real object of the Conference seems to have been to attract rather more public attention to aeronautical affairs than is usually given to the discussions of the R.Ae.S.

Probably the Conference has cost very little. There has been no free outing to Crofton, as in October 1920. There has been no free lunch at the Guildhall. Everything has been done in accord with the best modern Geddes methods. There has been nothing grandiose about the scheme, as was the manner in the middle Geddesian epoch, wherein the last Conference took place. Thus we see that the Air Ministry is already doing its best to economise.

### The Geddes Axe and the Air Ministry.

People are rather inclined to jeer at the Geddes Axe and its effect, but personally one believes that it is already proving quite effective. Sir Eric Geddes may not be a very great man, for very few such are produced per century, but he has much ability. One was going to say that he has his points, but one recalled in time the remark of the political wit who said that Eric Geddes reminded him of the Beef Trust and Anckland Geddes reminded him of a Meatless Day.

Be that as it may, a man could not rise as he did before the War to be chief of the North Eastern Railway, probably the most efficient and certainly the most modernised railway in the world, without a large share of ability. And if he did make chaos out of the order of the Army Railway system in France when he was sent to improve and expand it, that was merely because the civilian mind trained in commerce does not appreciate the difference between the problems of peace and the problems of war. It is because none of our Captains of Industry (which are not quite the same things as *chevaliers d'industrie*) understood those differences when called in to help the Army that our Income Tax is 6s. in the £1.

At any rate Sir Eric Geddes himself has certainly learned much from the horrors of the Great Peace, and his Committee is composed of very able men. Thus there is every reason to regard the work of that Committee quite seriously. So far as the Air Ministry in general and the R.A.F. in particular are concerned it seems that the Geddes Committee has not been altogether unreasonable.

Rumour has it that £5,000,000 has to be economised out of the £19,000,000 allotted last year. This seems a huge reduction, but it is only in about the same proportion as the reductions demanded in the Naval and Army Estimates. The Naval Estimates might well have been reduced still further and the difference might have been made over to the R.A.F., but it is necessary to recognise the fact that the majority of free and independent voters, which means most of Carlyle's "mostly fools," still regard the Navy as our First Line of Defence, and so no political Committee can yet dare to

cut down the Navy's money to the point which it will reach when the R.A.F. comes into its own. So taking it all round the R.A.F. seems to have been treated quite as well as it had any reason to expect.

Where the Air Ministry is going to economise that £5,000,000, or whatever the sum may be, must be an unpleasant problem for the Air Council, and one does not in the least profess to know where the saving is to be made. Still one may perhaps be permitted to make some guesses or suggestions as to how and where retrenchment and reform might take place.

### The First Economy.

First of all, of course, there is the Department of Civil Aviation. The Controller-General of Civil Aviation himself showed the way of retrenchment, if not of reform, a year or so ago when he returned to the Treasury some hundreds of thousands of pounds which might have been well spent on developing commercial aircraft and on organising air routes. It will be remembered that the money which he saved was spent on paying the debts of the Ministry of Munitions.

No doubt this year it will also be possible to save a good deal out of the Civil Aviation Vote, seeing that there is so little in the way of results to show for the last two years. It is true that the Air Ministry is practically committed to an expenditure of £200,000 per annum for the next two years on subsidy money to air-lines. But it is not bound to pay all of this for actual flying subsidies, which is the least profitable of all methods of expenditure.

The truest economy would be to spend the bulk of it on new and improved aeroplanes and on proper ground organisation so that the air lines may be relieved of overhead charges and so may be able to spend their own money (if they ever do spend their own money) on actual running expenses. With the present enormous rate of subsidy at so much per trip it seems as if the air lines pay running expenses and everything else out of the subsidy and have a trifle left over for profit. Which is the worst possible way of teaching air line operators how to operate efficiently and economically.

### Less Research and More Supply.

Another direction in which it seems that much money might be saved is in the Departments concerned with Supply and Research. Naturally the whole R.A.F. depends on the effectiveness of those Departments, and so one would be the last person in the world to advocate any cheese-paring policy which would save money by false economy in either Supply or Research. At the same time one is very strongly of the opinion that both Departments could be made very much more efficient without in any way affecting their effectiveness.

So long ago as Nov. 25th, 1921, a deputation of ex-Service Civil Servants, introduced by Mr. Baldwin Raper, who is to-day undisputedly the most active friend of Aviation in Parliament, interviewed the Secretary of State for Air on the subject of the employment of ex-Service men in the Air Ministry. Among the subjects raised were the dismissal of ex-Service men from the Ministry and the employment of non-Service men and women as clerks. Reference was also made to what the deputation called "Kingsway Majors," officers who had been given commissions during the War in order that they might be retained at the Ministry, and who had no better ground for retention than non-Service men.

One gathers that Captain Guest took the soundly economical view that the posts of short-hand typists should be filled by women. Also it was stated that a committee should be set up to deal with the substitution of technical as well as clerical employees, and that all cases of non-Service employees would be reviewed.

Whether anything has yet been done by this committee one does not know. But one does know that there are still many "Kingsway Majors," not to mention Captains, Lieutenants, and Civilian Experts, in most of the technical departments and sub-departments who could be jettisoned with distinct advantage to the Ship of State.

### Official and Trade Research.

This superfluity of non-Service or pseudo-Service officials applies not only to the Air Ministry itself but to some extent to the Royal Aircraft Establishment at Farnborough. Roughly speaking the people at the Air Ministry indicate the subject into which research is to be made, the people at Farnborough do the actual work of research, and then the people at the Air Ministry say whether they are satisfied with the results or not. No doubt Farnborough initiates much research on its own account, but at the finish it is Kingsway which acquires the results.

Now, let it be clearly understood that aviation owes a very great deal to the common sense and initiative of the technical people, both practical and theoretical, at Kingsway and Farnborough. The former have ordered a vast amount of most interesting and valuable experiment work to be done by the Trade and so have enabled the best firms to maintain the pick of their design staffs and mechanics. The latter have done a great deal of laborious practical research and experiment which it would not pay a commercial firm to do unless it were in a very big way of business, like the big steel and armament firms. And the result of this research has been handed out in a most kindly way to the Trade, which has on occasion forgotten to acknowledge it.

Therefore one is all in favour of maintaining these Departments at the highest possible pitch of efficiency. But it is undoubtedly a fact that both of them might be weeded out to an extent which would effect considerable economies and produce still higher efficiency.

### A Monument of Inefficiency.

It will be remembered that last week one cast aspersions on the intelligence of the sub-department which deals with radiators. There you have an example of a section which might well be economised out of existence. Whether it costs little or much does not affect the question. So far as its results have been concerned whatever it has cost has been money wasted. And apart from what has been directly wasted on its up-keep it has cost many thousands of pounds in causing the manufacturer of unnecessarily large and costly radiators, the expenditure of petrol and engine-power to carry them, the crashes produced by inefficient radiators, and so forth and so on.

By abolishing the radiator section and leaving the development of radiators to the engine and aeroplane manufacturers considerable economy would be effected. British manufacturers of radiators on the whole seem to have very little more intelligence or practical knowledge than the radiator sub-department under the Air Ministry. But if the aero engine and aeroplane manufacturers were left to themselves, instead of being forced to fit what this futile sub-department specifies, they would very soon force the manufacturers of radiators to find out what was most efficient and economical.

And then the people at Farnborough would have some very pretty research work to do in finding out the purely scientific reasons for the superiority of one radiator over another under given circumstances. Which is the line of research along which Farnborough ought to operate.

### A Definite Harm.

Another equally futile, and actually deleterious sub-department which would be better if economised out of existence is that which deals with the protective coverings of aeroplane fabric—commonly known as the Dope Department. So far as one can discover it has never since it came into existence early in the War contributed anything to the general stock of knowledge on the subjects of either dope or pigment.

It has certainly acquired a certain amount of theoretical knowledge itself, for it has had the experimental results and the formulae of the highly organised research departments of all the cellulose and dope and paint firms at its disposal. But one cannot discover that any of the many firms in those lines of business have ever received the slightest benefit from the department, though they themselves contribute their share as taxpayers to the support of the department.

Rather is the contrary case for the precious department, having acquired knowledge of a sort, largely at the expense of the very firms whom it is damaging, prepares wonderful formulae for dope, pigment and so forth, publishes these formulae free gratis to all and sundry for its own glorification at home and abroad, and so makes it possible for buyers abroad to purchase raw material and make up their own dope and pigment. Thus it does its best definitely to take the bread out of the mouths of the very people who are putting bread into its own mouth.

As a matter of fact the knowledge and intelligence of the Dope Department is so limited that to a large extent it defeats its own object, in that the formulae which it publishes and the rules on which it insists and the specifications which it lays down are so far from being the best possible that ultimately its victims find that they would have done much

better to have bought their knowledge and material from the legitimate firms in the Trade. But in the meantime these legitimate firms have been kept waiting for business just when the country most needs business.

Thus one sees here another department which costs a certain amount of money, which is of no benefit to the science which it is supposed to serve, which has definitely a deleterious effect on the industry which it is supposed to help, which prevents to some extent the expansion of British Trade, and which cannot show anything to justify its existence, past, present, or future. The Air Council has therefore a very plain and simple method of effecting another minor economy.

### The Opportunity of the New Brooms.

Doubtless there are other sub-departments at Kingsway and Farnborough in which similar economies could be made, therefore the new Controller-General of Supply, Equipment and Research, with the new Director of Research, should have quite an entertaining time emulating the traditional new broom in the interests of efficiency and economy.

Both of them are hard workers themselves and have the knack of discovering who is efficient and who is not. Both of them have practical experience of aeroplanes and aviation. Neither of them is of the breed of the "pure" scientist. So neither is at all likely to be impressed or misled by weird formulae, columns of appalling figures, comic exhibits in test-tubes or any of the other tricks by which the pseudo-scientist fools those in authority.

They are more likely to insist on practical results, such as radiators that cool engines, dopes which stay stuck, figures which show efficiency, and formulae which produce economy. In fact one believes that the "Kingsway Majors" and the imitation scientists and all their breed are likely to have quite an unpleasant and chilly time during the next few years.

### Air Force Efficiency.

On the purely militant side of the Air Ministry there is little fault to find and little economy to be made. The R.A.F. is quite wonderfully efficient considering the short time it has been on a peace footing. If there is a weak spot it is half-way between the wise and experienced officers in the higher commands and the keen young flying officers and flight lieutenants.

There are undoubtedly some squadron leaders and perhaps a few wing commanders who though doubtless excellent leaders of fighting men during the War are not efficient in handling men in time of peace. They cannot understand that smartness on parade is an outward and visible sign of an inward and spiritual grace. Nor can they understand that the little amenities and conventions of good society should be observed at mess and in the anteroom so that the young officer of the Royal Air Force may in time be accepted as the standard type English Gentleman as was the Officer of the Line in the Old Army before the War.

As Mr. Bernard Shaw remarked some time ago, we do not drive on the left side of the road because it is morally or ethically wrong to drive on the right. We do so merely because an accepted rule of the road makes for safety and comfort in our existence on the road. Similarly the intelligent officer or man realises that Service rules and regulations exist largely because the experience of men older and wiser than they are has shown that such rules and regulations make for personal comfort and general efficiency and economy.

It is the unintelligent man who kicks against customs which have the sanction of antiquity. The unintelligent man may be quite clever and quite brave and quite a good fellow in many ways, but his lack of real intelligence, which is quite illogically called "common sense," is bound to prove his undoing. Which was the case with that quite clever but utterly unintelligent officer who was the originator of that silly attack in the *Pall Mall Gazette* recently.

### The New Breed.

Happily there is growing a new type of young officer, mostly flight lieutenants and their juniors, who study the history of war and the organisation of armed forces, young officers who realise that Clausewitz is as important to the R.A.F. officer to-day as he has been to every commanding officer for the past hundred years. When a few more of the brave but brainless people in the middle zone of officers have been removed the brighter junior officers will get their chances.

And one hopes that at the same time fair chances will be given to the large number of clever and keen young officers with short service commissions who are resolved to win permanent commissions if it can be done. There are many more such officers than perhaps those in High Places realise. In fact keenness among short service officers is if anything in a higher proportion than among the permanent officers.

One knows that a short service officer can, with a very little luck, make himself indispensable to the R.A.F. It would be a great consolation to many such to know just how much



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provistas del dispositivo patentado  
de conbco variable Fairey que da  
una alta capacidad y potencia de  
ascensión combinada con una  
velocidad baja de aterrizaje.

they have to depend on luck and how much on genuine ability to attain their ambitions.

### The Benefit of Economy.

Still, taking it all round, the R.A.F. compares very well with the Senior Services as they are today, and the whole Air Force is run as economically and as efficiently as either. If the Chancellor of the Exchequer insists on a cut

in the Air Force Vote then it is up to the officers and men to do the same work, or more of it, with less money.

Which is exactly how the Old Army learned before the War to be the most efficient and economical Army in the World. And is exactly why the British Expeditionary Force prevented Germany from winning the War before Christmas 1914. All of which is a very useful lesson for the R.A.F. in economy and efficiency.—C. G. G.

## THE CROYDON AIR "RALLYE,"

The Department of Civil Aviation must have some special and efficient form of time avial which looks after its misdoings and saves it from the full exposure of its own follies. It arranged the Air Conference visit to Croydon at a time of the year when the odds are all on bad weather and the weather in the preceding few days had been about as bad as could be.

At 09.30 on Monday morning, the day of the "Rallye," Croydon Aerodrome was enveloped in fog. A few minutes later a light southerly breeze sprung up and by 10.00 hours the whole sky was clear and visibility was perfect.

The "delegates" (so-called, though one failed to discover by whom they were delegated), some of whom looked more like "delicates," arrived by special train from Victoria and were run right onto the aerodrome, alighting at the private station of the Aircraft Disposal Co., whose stock they first inspected.

As the train arrived, Mr. Piercy, looking very countlike, took the air on one of the white D.H.9s, for a Swiss company. He escorted the train up to the platform, and from then onwards the Disposal Co. made the best show of the day, keeping machines in the air continuously. A Snipe was flown by Mr. Haynes. Messrs. Piercy and Foot on D.H.9s and Mr. Perry on a Bristol were taking passengers into the air constantly. Also Mr. Stocken made his debut on an S.E.5a, and put up a very good show.

Mr. Muir then took up an F.4 Martinsyde. This is the standard single-seater, which has been converted by the Disposal Co. into a two-seater. It is a very nice clean-looking job and does great credit to Mr. Olney of the A.D.C. Major Grant very kindly allowed one to go as passenger in the machine and for the space of ten minutes or so Mr. Muir threw it about upside-down, doing loops, rolls, spins, etc., until one wondered what particular insult in THE AEROPLANE Mr. Muir was avenging.

As a matter of fact, owing to the speed and controllability of the "Tinsyde" one feels the stunting much less than in the slower type of aeroplane and it is much more pleasant. We finished with a straight run across the aerodrome "all out" about ten feet from the ground.

Meanwhile all the commercial and special machines had been drawn up in line along the top of the aerodrome. The centre of attraction was, naturally enough, the Gloucestershire Aircraft Co.'s Mars 1st, known to the world as the "Bamel." She (or is it a "Bamel" ("he") looked very quaint placed next to the "City of London" in the line, it reminded one of "Dignity and Impudence."

## R.A.F. INTELLIGENCE.

### R.A.F. Appointments.

From the *London Gazette*, Feb. 2nd.—R.A.F.—Grp/Capt. E. R. Ludlow Hewitt, C.M.G., D.S.O., M.C., A.D.C., is appointed Air Secretary to the Secretary of State for Air, and relinquishes the appointment of Deputy Director of Training, Air Ministry (Feb. 1st).

Grp/Capt. P. W. W. Wing, C.M.G., C.B.E., is appointed Deputy Director of Training, Air Ministry (Feb. 27th).

GENERAL DUTIES BRANCH.—Wing/Cmdr. F. Ranken, O.B.E., is placed on half-pay, Scale B (Feb. 1st).

### The New Air Secretary to the S. of S.

The appointment of Group Captain E. R. Ludlow-Hewitt, C.M.G., D.S.O., M.C., A.D.C., to be Air Secretary to the Secretary of State for Air, which is officially recorded this week, will give general satisfaction. Grp/Capt. Ludlow-Hewitt was an officer of the Royal Irish Rifles who joined the R.F.C. some time before the War and in it distinguished himself not only as a very skilful and gallant pilot but as an exceptionally efficient officer. The work of his Squadron, and later of his Wing and Brigade, was always done with clock-work regularity and with the maximum effect. He earned the respect of his juniors by never asking anybody to do anything that he did not do himself, and in most cases he did it better.

Many who served under him did everything but bless the energy and enterprise of their C.O., and consequently as a Squadron Commander and Wing Commander Major or Lieut.-Col. Ludlow-Hewitt was only loved by those who believed in making war efficiently. Pilots who have served under him tell of starting at dawn on raids across the enemy's lines and on nearing their objective meeting their C.O. on the

Other machines were the Bristol ten-seater, the D.H.29 monoplane and the D.H.18, all with Napier engines. The Handley Page O/400 with the two Bristol "Jupiter" engines, the D.H.14 (Kolls-Royce "Condor"), Napier- and Hispano-engined Westlands and the Avro with a 150 h.p. Siddeley "Lynx" engine. This latter is the new radial-engined training machine for the R.A.F.

Owing to officiousness on the part of the Department of Civil Aviation the D.H.29 was not allowed to fly. This caused much disappointment as the public performance of this machine had been eagerly awaited.

Mr. Barnard on the "Vimy" and Mr. Powell on a D.H.18 carried 95 passengers between them during the morning and later Mr. Barnard on the "Vimy" had a scrap with Mr. C. D. Barnard on a D.H.9c, the machines chasing one another's tails for several minutes.

The "delegates" were during this time going for joy-rides in the other machines, and some were having the times of their lives.

After they all got tired of this they returned across the aerodrome to the train, getting in the way of all the machines as they were trying to land, in order to catch the train at 13.00 hours back to town and so they missed the *pièce de résistance*, which was Mr. "Jimmy" James on the Bamel.

Owing to many and varied circumstances, she did not get going until 14.15 hours. After warming up the Napier engine, Mr. James taxied out to the far side of the aerodrome, turned towards the Customs and opened out the engine. She took off in about ten yards and went up with an astonishing climb. This caused the whole aerodrome staff, whether they were laughing or not, to come out and watch.

Mr. James proceeded to show her off by a series of runs across the aerodrome and she seemed entirely quick. At the end of each run he pulled her up and she took the climb and held it seemingly for as long as Mr. James liked. After some ten minutes of this, he landed up by the A.D.C. and everyone was amazed to see her sit down at a normal speed of apparently 50 m.p.h. and pull up very much quicker than do very many commercial machines. One of the old hands suggested she should be called the "Martindonsdensyde."

Several regular air line machines started off and later on others arrived.

Undoubtedly it was a most successful day, though the "delegates" should have been compelled to make a day of it on the aerodrome. As it was the whole affair was too hurried. Still, one feels sure that they all considered they had had full value for the money they paid for their journey down from town.—G. D.

way back, he having started before dawn to have a look at the objective himself so as to be sure afterwards that his pilots reached the right place. If he ever earned unpopularity with his superiors it was because he insisted on flying and doing things over the lines for his own satisfaction which were no part of the duty of an officer of his rank.

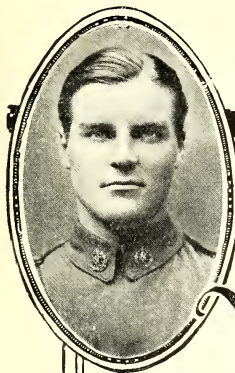
After much service in France he took charge of training in England and there demonstrated that he was just as capable as an administrator and organiser as he was on active service as a commander of men. At the Armistice he was again overseas, this time commanding a brigade in Northern France and in Belgium with all his usual efficiency. Since the War he has been Deputy Director of Training, and the results of his work are evident to anybody who is in close touch with the R.A.F.

His personal keenness on flying, his passion for efficiency and his wide and deep all-round knowledge of aviation and humanity combined guarantee his success in his new occupation.

### The 3rd Reunion Dinner of ex-R.N.A.S. Officers, Canada.

On Dec. 10th, 1921, was held the third reunion of ex-R.N.A.S. officers in Canada which took place at the Ritz-Carlton Hotel, Montreal, in the form of a banquet. Wing Commander R. Leckie, D.S.O., D.S.C., D.F.C., Canadian Air Force, presided, and the following is a list of the officers who were present:—Wing/Cmdrs. J. L. Gordon and R. Kedpath, S/Ldrs. B. D. Hobbs, C. MacLaurin, A. B. Shearer, W. C. Power, L. S. Breadner, and J. A. Glenn; F/Lts. G. R. Hodg-

(Continued on page 107.)



# Famous Pilots and the NAPIER 450 H.P. AERO ENGINE

Major O. Stewart has had a distinguished career in the R.F.C. and R.A.F. During his first year in France he was responsible for bringing down a number of enemy machines, and was awarded the M.C., and later the A.F.C. Whilst acting as Ferry Pilot, made 120 crossings of the Channel. Major Stewart has had considerable experience on experimental work, being in charge at the experimental station at Orfordness.

The following letter from Major Stewart is of value, having regard to his long experience in connection with experimental work, when he came in touch with practice in every engine used in the Air Service.

## MAJOR O. STEWART.

I have flown the Napier Lion engine for a large number of hours, both in single and twin-engined aeroplanes.

Without any exception I think that it is the best aeroplane engine made. It combines flexibility and smoothness with a remarkably light weight per horse power, and it provides an example of good design and accurate workmanship hitherto unequalled in the world of aeronautics.

It is interesting to remember that for aeroplanes the Lion was and is still the only British engine that can compete successfully with the best Continental examples in regard to light weight and reliability.

Yours faithfully,

*O. Stewart*

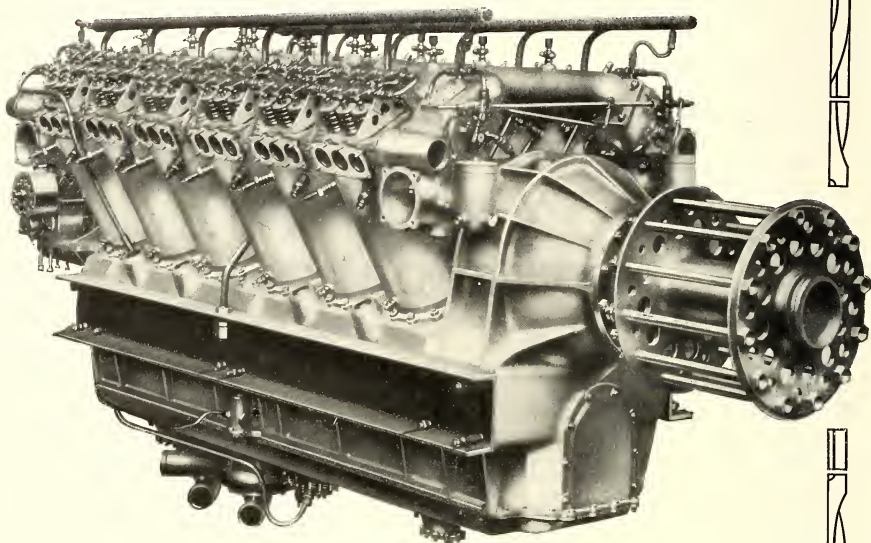
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## THE WEEKLY COMMENTARY.

A second instalment of the articles on "The Commercial Aeroplane" deals with the very serious obstacles to rapid progress in the design of aircraft which result from the condition of subjection to a Government Department in which the Aircraft Industry is now held.

It is pointed out that these obstacles are fundamentally due to the fact that the controlling body is a Government Department, and that the evils of Government control are largely independent of the efficiency or goodwill of the particular department.

The very powerful incentive to the negation of enterprise provided by the present subsidy schemes is emphasised.

A note on, and some illustrations of, a new Supermarine Amphibian are given in this issue. The particular machine is of some military importance, and presumably on this account no very full details thereof are available at present.

The second of the series of "Practical Hints on Aircraft Instruments" deals with engine revolution indicators and with flexible drives of the type associated with that instrument. The flexible drive in the past has had to submit to much ill treatment and has suffered much in consequence. This note should help to secure relatively human treatment to such appliances from all who read it.

## THE COMMERCIAL AEROPLANE.

By W. H. SAYERS.

### II. Incentives to Stagnation in Design.

In the previous instalment of this article it was suggested that a very great improvement in the quality of aeroplanes, as measured by the total weight transported per h.p. and by the proportion of that total weight which could consist of useful load, was vitally necessary if civilian aerial transport was to become a reasonable commercial proposition. It was further suggested that the possibility of really great improvement in this direction was perhaps not so remote as it might seem.

#### A UNIVERSAL STATE OF SUBJECTION.

But it is necessary here to insist upon the seriousness of some of the very colossal, though purely artificial, obstacles to progress at a reasonably rapid rate which now exist.

Most important of these is the existing subjection of the Aircraft Industry in this and in most other countries to the dictates of a Government Department. It is perfectly true that in America there seems little hindrance at the present to the production of aircraft of any type, size or form, of any degree of insecurity or unsoundness in design, and that the Military and Naval Air Services seem inclined to encourage experimental design in a manner singularly free from the usual obstructive methods of such bodies.

In France, too, apparently anything that will hold together and get into the air is likely to be ordered and paid for by the authorities, but thanks to the wonderful subsidy system the profits of building and operating mediocre machines are so large that there is no incentive to experienced constructors to make any experiment which would risk official disapprobation.

Both in America and in France there is a chance that inspiration may light upon some unknown enthusiast, and the conditions are such as to make it possible that sufficient cash may be raised to materialise such an inspiration. Germany, it is very certain, will make very great strides as soon as the present idiotic restrictions are removed, and the longer they are enforced the more certain are those strides to be rapid.

In Britain the conditions are such as may suffice entirely to prevent important progress until such time as other nations have secured an enormous start along the necessary path.

There are two possible British customers for the British aircraft manufacturer. One is the R.A.F. The other is the commercial air transport industry.

#### THE R.A.F. AND PROGRESS.

The R.A.F. to all intents and purposes may be neglected as a partner in the business of improving aircraft to a radical extent. This is merely because the R.A.F. is a military organisation, and, in the present state of ignorance of the

population from which military forces are necessarily recruited, a military force must depend for its efficiency upon the strict observance of a specialised form of ritual which includes such minor matters as discipline, routine, and a number of other very effective checks on the exercise of an undue degree of imagination. Further it is not in the interest of any military organisation, particularly in unsettled times such as the present, to initiate any very profound change in the capacity of its weapons.

For such a change may involve a large reconstruction of the ritual, in itself a procedure abhorrent to the military mind, and there is always the risk that if it does embark on such an adventure some not too friendly rival may get wind of the move, complete the resulting re-armament and re-organisation of its own forces and proceed to suppress the originator of the scheme while he is in the throes of the changing over his ritual.

In any case it is practically hopeless to expect from any military officer of high rank a well-developed capacity for experimentation of a far-reaching character. Such a capacity involves both an inherent mental quality of intelligent imaginativeness and the continual exercise thereof. If the exercise of this quality is suppressed in youth it is barely likely to reassert itself with any vigour in middle age.

If any young officer of a military service both possesses that mental gift and allows himself to exercise it, it is perfectly certain that some of the resulting experiments made by him will be thorough and—*from the official point of view*—disgraceful failures, and his chance of rapid promotion, and consequently of attaining a position wherein he can influence official policy to a large extent, will be minute.

These facts are regrettable but inevitable for so long a time as technical knowledge combined with an ordered imagination remain qualities confined to a small minority, while Armies, Navies and Air Forces have to be manned by average samples of the population.

#### AIR TRANSPORT AND GOVERNMENT CONTROL.

The Commercial Air Transport Industry then has to be regarded as the sole source from which encouragement towards the sweeping improvements which are necessary may be sought, and judging by the precedents of the mercantile marine, and the railway business, the incentive provided by the possibility of achieving reduced working costs should suffice to carry through the necessary experimental and development work.

But—and it is a very big but—the pioneer development of both marine and rail transport was due to practically unfe-

tered private enterprise. It needs only a survey of the present state of the electricity supply business in this country, which from its earliest days has been controlled by Governmental ordinances made "in the public interests," to realise how serious a handicap to development even the most well-meaning of official supervision can be in such affairs.

And there is no comparison to be made between the present state of the Air Transport business and that of electricity supply 25 years ago.

#### ABOMINABLE INSTITUTIONS

The abominable institution of subsidies for "approved services," plus the still more outrageous arrangement by which such services can hire-purchase "approved" aeroplanes at less than cost price provide arrangements for the fettering of enterprise much more effective than any complete prohibition of aircraft construction could ever be made.

No commercial man of modern times is likely to gamble on the success of a new type of aircraft whose development must be costly if the official encouragement given to the use of obsolete machines is to be withheld from him as a result of his enterprise.

Neither is he likely to pay the full cost price of a novel machine which only costs 75 per cent. of the price of a standard type when he can hire-purchase the standard type for the same total outlay spread over a period of years.

#### THE DEPARTMENT OF CIVIL AVIATION.

Now the Department of Civil Aviation which decides what constitutes an approved line and what are to be approved aeroplanes could, of course, mitigate the effects of these hindrances were it to pursue a sufficiently enlightened and progressive policy. But in the very nature of things it is not in a position to do so. It is a Government Department—ostensibly a civilian department—and within certain narrow limits it should afford a little more scope for the development of intelligent imagination on the part of its staff than can any purely military department. Nevertheless it is a Government department, and a custodian of public funds.

Quite properly under present conditions it would be regarded as intolerable that the public funds should be employed in the exploitation of enterprises of a distinctly speculative nature. Quite properly because in the present standard of political and public intelligence no method exists which will certainly secure that such a department shall be staffed only by those who will speculate wisely and usefully. Up to the present the only successful speculations have been made by those who personally stand to profit by success or to fall through failure, and rapidly rising and falling Government departments, however enterprising, might have serious inconveniences.

And further, the only legitimate excuse for any form of Government control is that it either directly or indirectly secures the safety of the public. It may be in the larger sense that it controls an industry in such wise that its activities conduce to the national safety, or it may be in the narrower sense of merely seeking to secure the personal safety of such of the public as are affected by the operations of that industry. This may be an adequate excuse for some type of Governmental supervision, but such supervision invariably handicaps progress, and may do so to an appalling extent.

#### THE DANGERS OF OFFICIAL SANITY.

The papers read recently by Wing Commander Beatty and by Brig.-General Bagnall-Wild, dealt with this legitimate aspect of the work of the Air Ministry. Both these papers are of the most helpful type. The requirements set out are eminently sane and reasonable. And it can scarcely be a matter for surprise if a Government Department possessing high officials of such enlightened and reasonable views seeks to make compliance with those views essential on all licensed commercial aircraft.

But once those requirements are codified and made com-

pulsory it may be a long and difficult business to get them modified to any serious extent. Neither Colonel Beatty nor General Bagnall-Wild will be able personally to consider any and every application for a relaxation or modification of such regulations in special cases unless civil aviation remains at its present level of stagnation. Civil Government Departments are little more habitable than a military service for the subordinate officer of experimental aptitude and necessarily such regulations become ritualised.

And reasonable and admirable as the said regulations may be as applied to machines of existing types, it is far from certain that they will be either necessary or possible with the improved types which may be developed in the near future. And the impossibility of applying them to such types may definitely prevent those types from being developed.

#### ILLUSTRATIVE FICTION.

It has been alleged that a certain concern which has long been interested in a type of aircraft of some novelty and promise succeeded in virtue of its sustained enthusiasm in persuading the technical authorities of the Air Ministry to submit a model of their type to tests at the N.P.L.

The results were somewhat surprising, but the end of the War, and a number of other causes, prevented further development. The concern however carried on and put forward further suggestions on the same lines. Impunity, even if successful, is never popular, and although the promise of the scheme was admitted the concern was told in effect that if they wished anything done in the matter they must persuade a recognised firm of aircraft constructors to take their scheme up and thus put the matter before the authorities in a form with which they could deal.

The firm of aircraft constructors was found, designs were made, a model was tested and aerodynamically showed a very marked improvement on any model of a complete aeroplane ever before tested under official auspices.

The question of an order for a trial machine arose. The Military Technical Authorities regarded the scheme as highly interesting, but could see no military use for the particular machine. The Civil Authorities were highly impressed, but did not consider it as suitable for civil work because the passengers would be unable to see out of it. And therefore this machine which if it fulfilled the promise of the wind-tunnel tests would mark a greater advance in aerodynamic design than has been effected by the combined effort of all the world's aircraft designers in the last eight years will not be built yet awhile.

This story is so perfect an illustration of the evils of Government control that it is inconceivable that it can be strictly accurate. It is none the less valuable as an illustration, because as Government Departments both the Military and Civil Authorities concerned are absolutely justified in refusing to risk public money on an experiment which they know they cannot put to a definite use even if the experiment is a successful one. What is wrong is the state of affairs which makes it practically hopeless to get such a machine built without their assistance.

The artificial discouragements to technical improvement being so great, it is necessary to insist very strongly upon the fact that improvement, and improvement of a radical nature, is not only essential, but is possible.

#### OFFICIAL ENCOURAGEMENT=STAGNATION.

Aeroplane design the world over has now suffered from more than seven years of official encouragement, and the rate at which it has progressed during that period is very definitely and decidedly slower than it was in the last two or three years before the period of Government control began.

This is not really the fault of the aeroplane designer, who during that period has had to design types which his customers would accept, though there is some tendency for only designers who are content to design such machines to survive, but of the said customers and their ignorance of what could be done if they insisted upon it.

**THE RESULT OF OFFICIAL DISCOURAGEMENT.**—A front view of the little 70-h.p. three-seater Dornier Flying Boat. There are reasons for believing that this machine may make an appearance in this country in the near future.

Herr Dornier has probably produced more aircraft of real novelty and efficiency during the past two years than any other designer in the World, and readers of the article above will note the significance of the fact that his work has been carried out in the face of the violent opposition of the most powerful Governments in Europe.





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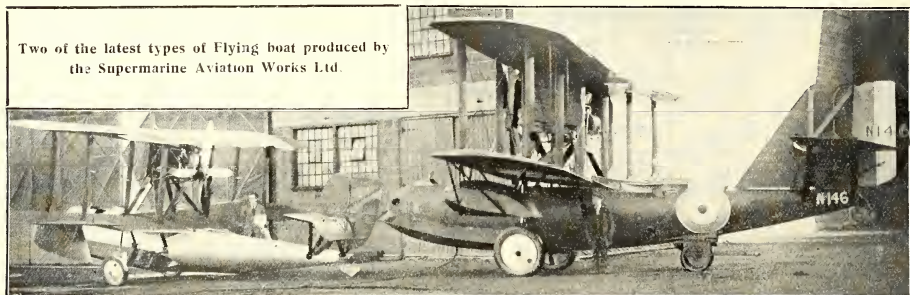
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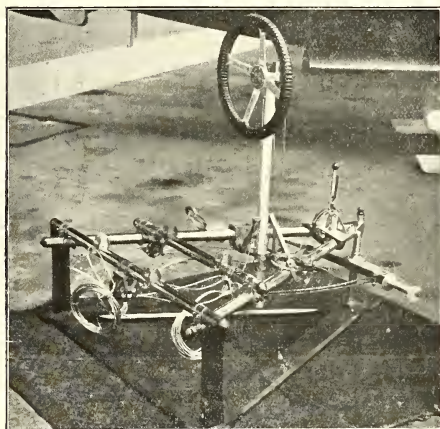


## SUPERMARINE ACTIVITIES.

Two of the latest types of Flying boat produced by the Supermarine Aviation Works Ltd.



On the left is the new Supermarine Single-Seat Fighter. The large machine to the right is the Fleet Spotter "Seal Mk. II."



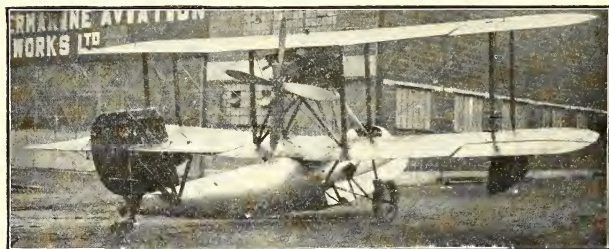
The Supermarine Dual Control Unit as fitted to their "Channel type" Flying Boats.

The latest product of the Supermarine Aviation Works Ltd. is a small high performance single-seat fighter amphibian designed for deck landing purposes. This machine is shown in two of the appended photographs, in one case alongside the considerable larger "Seal Mark II" fleet spotter. The machine was completed at the end of December, 1921, and has given very satisfactory results on its initial trials.

The machine is fitted with a Hispano-Suiza engine of 300 h.p., and it is understood that the machine combines the usual excellent seaworthy qualities of the Supermarine type, with a performance hitherto associated only with land types of fighter. It is regarded as a perfectly practical matter to fly this machine from the turret platforms used on battle-cruisers and the like for light scouts.

The very great advantages of using a thoroughly seaworthy craft for such duties rather than the usual scout plus emergency flotation gears and such ingenious makeshifts is very obvious.

A third photo shows the very neat dual control unit which is used on Supermarine "Channel type" boats for instructional purposes. The whole outfit is mounted on a frame to form a single unit, which can be removed in a very short time, leaving the pupil's cockpit free for the installation of cameras, guns, wireless, or any other equipment which it may be necessary to install.



Three-quarter rear view of the new Supermarine Deck Flying Amphibian Fighter. It can be seen that the hull is of the standard Supermarine circular type, and that the wheel undercarriage is generally of a type similar to that used on the machine which did so well in the Air Ministry competition of 1920. For the rest, the machine appears to be notable only for simplicity and cleanliness of outline, qualities which doubtless account for its high performance.

## DIESEL ENGINES FOR AIRCRAFT.

The Aviation Correspondent of the *Daily Telegraph* announced on Jan. 26th that success in the adaptation of the Diesel engine to aircraft was near at hand. After referring to the so-called Junkers Diesel engine, the alleged production by an unnamed French engineer of a Diesel car engine, he relates that experiments at the Royal Aircraft Establishment have reached a point which assures complete success.

The said correspondent proceeds to remark that the Diesel principle does away with carburetter and magneto, and allows the use of heavy, high flash-point oils, so that he evidently means what he says.

It is therefore well to point out that the Junkers engine to which reference is made is not a Diesel, uses petrol and em-

ployes a magneto, that the R.A.E. experiments so far have been concerned only with petrol injection in place of the carburation system, and that there is a very wide range intervening between successful petrol injection by itself and the complete Diesel type, with heavy oil injection and automatic ignition by high temperature of the cylinder air due to a very high degree of compression.

A successful and satisfactory fuel injection system will be a step, but only one step towards attainment of the Diesel aero engine.

As to the alleged French Diesel engine for cars one may be content to await authentic details, but there is a gap between a practicable car engine and a satisfactory aero engine scarcely smaller than that between the power plant of a traction engine and of a modern destroyer.

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## PRACTICAL HINTS ON AIRCRAFT INSTRUMENTS.

BY A. W. HULBERT.

### NO. II.—REVOLUTION INDICATORS AND FLEXIBLE DRIVES.

In the opinion of the majority of pilots the "rev. counter" is the most important fitting on the instrument board, the airspeed indicator coming second; in fact, many would willingly fly a machine with these two instruments as their only guide.

Practically every British machine will be found to be fitted with the standard R.A.F. Revolution Indicator Mark IV or Mark V, geared 4:1, and connected to the engine by means of a detachable flex. drive.

Briefly, all the rev. counters of the above pattern are of the centrifugal type and consist of two balanced weights, pivoted on a revolving spindle and normally resting against it. This spindle is coupled to the engine by means of the flex. drive and when the engine is running the spindle will rotate at the same speed, causing the weights to fly outwards until they are balanced by the opposing force of a spiral spring.

By means of suitable mechanism the movement of the weights is transmitted to a pointer moving over a dial calibrated in revolutions of the engine.

Dealing, firstly, with the internal mechanism, this will be found to be extremely simple and robust; and with ordinary usage will last many hundred hours' running.

It should be taken down for a periodical overhaul by the makers and after every 50 hours' work it is a good plan to fill the grease cups which lubricate the spindle bearings. The greatest care, however, should be taken not to get any grease on the spindle—this will work its way onto the indicating mechanism and erratic readings will result.

The instrument should be checked periodically against a specially calibrated master tachometer; this master instrument, in turn, should occasionally be sent to the makers or to a Government testing depot for test on a stroboscope. When fitting a rev. counter to a machine there should be plenty of room left behind the instrument board to enable the flex. drive to take a natural bend—if it is jammed up against, say, the petrol tank, and bent almost at right angles, the friction between the revolving inner flex and the stationary outer sheathing will cause the pointer to jump and quiver, especially at low speeds. The amount of wear taking place in the flex. itself will also be greatly increased. Another important point is to keep the whole of the inside of the outer flex. packed with good quality lubricating grease.

As regards general fitting, it is always advisable to avoid sharp bends in the flex. The length of the drive should be kept as short as possible; it will not only be more efficient but easier to fit.

Always see that the connections to the engine and rev. counter are screwed up tightly. If the brass union nuts on the flex. are allowed to work loose the square ends of the drive and their corresponding square holes in rev. counter and engine connection will soon become badly worn and damaged. Should the drive at any time break, which is rather unlikely, don't attempt to splice it; this is a risky thing to do and a new inner flex. is cheaper by far in the end.

It was mentioned in the beginning of the article that the standard R.A.F. Revolution Indicator is geared 4:1; this is to enable the drive to run at a reduced speed and minimise wear and tear. As the engine connection is usually taken from a pump spindle or some other shaft not running at the speed of the crankshaft it is necessary to fit an external gearbox giving a gear ratio which will cause the crankshaft speed. In many of the latest types of aero engines the gearbox is built into the engine itself, in which case it is merely necessary to screw the flex. drive onto the union provided on the engine.

One word more about the flex. drive; if this happens to be too long for the job, don't tie knots in it—draw a suitable length from the store. Tying knots in the flex. is hardly conducive to good working of either drive or revolution indicator.

### AIRCRAFT INSURANCE.

His many friends in and out of the R.A.F. will be interested to learn that Major H. Hemming, Managing Director of the Bermuda and West Atlantic Aviation Co. Ltd., of 166, Piccadilly, has added to his overseas aerial transport interests the work of aviation insurance at home. He is working in connection with Mr. W. K. Arnott, the well-known insurance broker, who already handles some of the most important aircraft business.

## LIGHTS FOR AERIAL NAVIGATION.

A very interesting lecture was given to the members of the Illuminating Engineering Society on Jan. 31st by Lt.-Col. L. F. Blandy. His subject was the Use of Lights for Aerial Navigation.

The navigational lights of night-flying aircraft are governed by the terms of the International Convention. The fitting of these presents serious difficulties in some types of aircraft. At present there was insufficient experience of night flying to determine whether the regulations were adequate. The usual signal red and green glasses had been found unsatisfactory when high intensity electric lamps were used behind them, and considerable experiment had been necessary to reach satisfactory tinted glasses.

When two modern aircraft, each at 100 m.p.h., were meeting, the rate of approach was 3.3 miles per min. Under the regulations the white head lights need only be visible at eight kilometres and the coloured side lights at 5 km. The time from sighting headlights to collision might be only 90 secs., and in that period the pilot had to discover whether a white light was the head or the tail light of a machine. For side lights the time was only 50 secs. This did not give the pilot much time in which to determine rate of change of bearing and decide upon necessary action to avoid collision, and it may be necessary to increase the range of all such lights.

As to landing lights the Research Department of the Air Ministry had been experimenting with a high-power 12-volt projector which would survive landing shocks. The whole lamp weighed 7 lbs., and could be run off either an engine starter battery or the general lighting battery. It was successful for general ground illumination from 500 ft. and for actual landing on unlighted ground.

As to ground lights, many forms have been tested and are satisfactory. The essentials are absence of heavy shadows and of dazzle.

A good deal of work had been done on fog-piercing lights, and there were distinct hopes that landing in comparatively thick ground mist could be arranged for safely. The real London pea-soup fog so far utterly defeated all attempts.

For navigating lights a distinctive shape was much more easily picked up if there were other lights about. The local lights at Lympne and Croydon were examples.

The modification of coast lighthouses to meet aerial requirements had been studied, but existing lights had been found to be recognisable from such distances that it was not at present thought necessary to modify British lighthouses, although many of these were at present useless to aircraft as they were obscured in certain directions.

### AWARDS TO INVENTORS.

Before the Royal Commission on Awards to Inventors there was heard the claim by Mr. Henry Leitner and of Joseph Lucas Ltd. in respect to the invention of electric generators for use on aircraft.

Mr. Leitner, who is known in aeronautical circles in connection with the design of metal aircrews, is well known in electrical circles as the designer of a highly ingenious constant voltage dynamo for train lighting. The problem of keeping the voltage of supply constant despite the wide range of speed when driven by the propeller type of windmill has many points in common with the problem of train lighting. When in 1917 it was found that German pilots were using electrically treated clothing, the demand for a suitable generator arose in this country, and Mr. Leitner produced it.

Counsel for the Crown admitted that the invention was of substantial merit and marked a clear advance.

The Commission reserved their award.

### AERO-CYCLES.

Presumably everybody connected with aviation rides either a bicycle or a motor-cycle at one time or another, therefore one need not apologise for drawing the attention of everybody concerned with aviation to the latest move of Rudge-Whitworth Ltd., more especially as that important firm had during the War quite a great deal to do with both the high quality and great quantity of British aircraft. What would probably interest most people in these hard times of decreasing wages is that the price of the Rudge-Whitworth push-bike, known as the "Aero-Special," has been very considerably reduced. In March, 1921, the firm re-established their original policy of making bicycles of one price and one quality, the latter being the highest possible and the former the lowest consistent with the high quality. Owing to the firm's excellent organisation and to the reduction of costs of production it has become possible to reduce the price while maintaining the quality. Spare parts have also been reduced.

So far as the Rudge-Whitworth motor-cycle is concerned their performances in all the competitions last year is sufficient guarantee of their efficiency. As in the case of the pedal cycles the price is as low as is consistent with the quality supplied. Therefore one can safely recommend them to the consideration of any aviator who wants a road vehicle of a quality equal to the aerial vehicle to which he is accustomed.

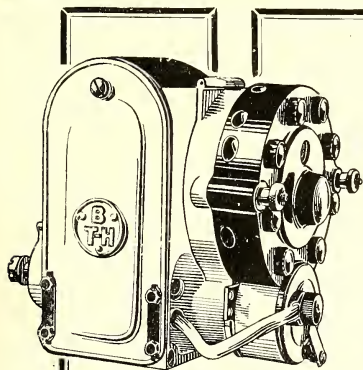
## AN APPRECIATION OF THE DH9c.

The following is an extract from a letter recently received from the Compañía Española de Tráfico Aéreo—the Spanish aerial transport company which is running the Seville-Larache Air Line:—

“On the occasion of the completion of the first three months during which we have been operating the first Spanish air service between Sevilla and Larache, we should like to take the opportunity to place on record our satisfaction with the material and personnel provided by you. Using these exclusively, you will be pleased to hear that we have, since the inauguration of our service on October 15th, 1921, till January 15th, 1922, successfully completed 85 return journeys. This represents 42,500 kilometres covered without difficulty or mishap and an incalculable saving in time and increase in regularity over the existing means of transport.”

The above company is using DH9c machines exclusively supplied by:

**The De Havilland Aircraft Co., Ltd.,**  
**Stag Lane Aerodrome, Edgware, Middlesex, England.**



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 Type A.V.8.

Over 30 Aerial Records have been created in the last three years by machines equipped with

### B.T.H. Magnetos

These magnetos were also fitted to five out of the eight prize winning machines in the Air Ministry Trials of 1920 and to the Aerial Derby winners of 1919, 1920, 1921.

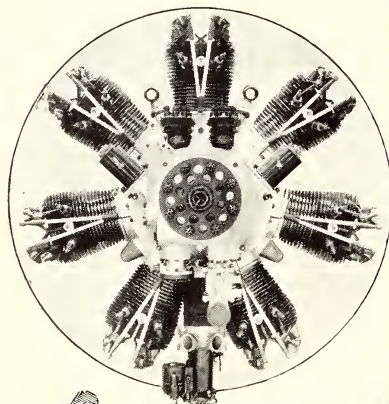
In addition to sharing in these achievements, B.T.H. Magnetos now have the distinction of helping to create the new

**British Speed Record**  
 held by

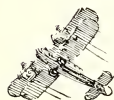
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150 h.p. Radial Engine.



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plane for any purpose  
can be designed and  
built by the firm.

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(Continued from page 96.)

son, Fred Fraser, W. R. Kenny, Hugh Peck, York Wilks, Gordon Harrower, F. S. McGill, A. T. Whealy, F. S. Fisher, E. C. Stoneman, "Gus" Edwards, Marcell Dubuc, "Curley" Boswell, Barkley Drummond, Bainbridge Hall, Mostyn Lewis, W. A. Curtis, R. Keirstead, Allan Wilson, A. Partridge, Ross Johnston, "Bunny" Emery, Norman Scott and J. G. P. Cleland.

As these gatherings have proved so successful it was decided that the reunion should be held annually at a definite time and place to be fixed later (the next to be held probably in the autumn or early winter of 1922, somewhere in Eastern Canada, possibly Montreal), and F/Lt. W. Edwards, the Air Board, Ottawa, Canada, would be glad to receive the names and addresses of any ex-R.N.A.S. officers who would care to be present should they find themselves in Canada at the time.

A further announcement will be made as soon as more definite particulars are received.

#### 55 Squadron Dinner.

The annual dinner of 55 Squadron, R.F.C. and R.A.F., will take place on Saturday, March 11th, at the Holborn Restaurant, at 7.30 p.m. Former members of 55 and present members of the Squadron, if there are any at home on leave, are asked to communicate with Wing/Comdr. J. E. A. Baldwin, D.S.O., O.B.E., Headquarters No. 7 Group, Andover, Hants.

#### 209 Squadron Dinner.

The second annual reunion dinner for Old Comrades of 209th Squadron R.A.F. (late 9 Naval) will be held at the Shaftesbury Hotel, Great St. Andrew Street, W.C.2, on Sat., March 11th. For full particulars apply to A. H. Middlemiss, hon. sec., 73, Devonshire Road, Hackney, E.9.

#### R.A.F. Boy Mechanics.

The Civil Service Commissioners announce that an open competitive examination for the entry of boy mechanics into the R.A.F. will be held in London, Edinburgh, Birmingham, Chatham, Plymouth and Portsmouth on May 12th. The limits of age are 15-16½ on July 1st, 1922. Regulations and forms of application will shortly be ready for issue, and will be sent in response to requests received by letter addressed to the Secretary, Civil Service Commission, Burlington Gardens, London, W.1, on or after Feb. 8th.

#### R.A.F. SPORTS AND PASTIMES.

##### R.A.F. versus R.N.

The R.A.F. ought to have beaten the Royal Navy at Queen's Club on Feb. 4th, but owing to circumstances over which it had no control, namely the Navy halves and three-quarters and not the snow, it was beaten by three tries (9 points) to a try and a penalty goal (6 points).

Like most "selected" teams, as differentiated from teams which exist as teams and nothing else, the R.A.F. representatives were an agglomeration of worthy young men who meant well, whereas the R.N. people strongly resembled a team. Which shows the advantage, purely from a football point of view, of belonging to a Service which spends most of its time at home in big depots where men can play together and get to know one another's ways as against a Service which is still largely at war or sprinkled all over the British Empire. For example the R.A.F.'s best full-back went overseas a few days ago and one of its best three-quarters

can only play by spending the night before a match in the train, whereas the R.N.'s team have played together for months, in fact their halves have been partners for years.

On paper the Navy had much the stronger team for they had five international players, Davies and Kershaw at half, Haynes, Gardner and Halloran forward, besides Bradley at three-quarter, who is to play for England next Saturday. The Air Force had only two, Lowe at three-quarter and Wakefield forward, their third international, Maxwell, being laid up by an accident. Yet even so the Air Force should at worst have drawn the game, for the Navy's first try was let through by the feeblest piece of full-back work imaginable.

This try was scored by H. W. V. Stephenson after 15 minutes' play as the result of some very pretty passing by the Navy backs. Davies failed to convert what looked like a sliiter. Soon after Kershaw picked up from a scrum close to the Air Force goal and passed to Davies who scored another try which he failed again to convert. Just before half-time Gardner, an R.M.L.T. private, scored from a rush by the Navy forwards. And again the try was not converted. In fact the Navy's shooting was about on a par with its shooting at other land targets during the war on Gallipoli and along the Belgian coast. A minute or so later S. P. Simpson, a R.A.F. forward, was laid out by an injury to an ankle and the Air Force played a man short for the second half.

On changing ends the Air Force improved considerably more than could be explained by the mere fact of having what little wind there was in their backs. They were attacking strongly the whole time and kept the game mostly at the Navy's end. Also three or four of the Navy's men were temporarily knocked out during this period, which would seem to indicate a certain exercise of vigour by the Air Force. One can only imagine that being a man short there were less Air Force forwards to get in one another's way, which seemed to be what they were doing to some considerable extent in the first half; at any rate the forwards showed no sort of combination during that period.

The R.A.F.'s first score was a goal, very prettily kicked by C. N. Lowe, from a penalty given for "feet up" right in front of the R.N. goal. A little later Wakefield scored well out on the right after a strong but chaotic rush by the Air Force forwards. Lowe made a good attempt to convert, but failed. Right up to the end the Air Force kept up the attack and would probably have scored again if a few minutes had been left for Chief Shipwright (Gilbert, the Navy's excellent full-back, was hurt just before time was called and could hardly have stopped another rush.

The Air Force would have been far more badly beaten but for the one good feature of the whole team, which is that every man in it will go down to stop a rush; and dropping on the ball at the feet of fast heavy forwards is the real test of pluck in a Rugby game. Certainly the R.A.F. team has plenty of courage and staying power.

As against that the Air Force would have beaten the Navy handsomely if the forwards had had any idea of how to play together in the loose. They have about as much notion of using their feet as a team from a school for the daughters of Chinese noblemen would have. The foot-work of the R.A.F. forwards is merely lamenable.

Of the halves, Russell was very quick in picking up and



Photograph by]

The R.A.F. Rugby Team which was beaten by the R.N. by 9 points to 6. ["Sport and General."

passing, especially when the ball did not go into the scrum. There seemed to be a good deal of time wasted in whistling back for that reason. Apart from that he seems to be quite a good scrum half. J. I. T. Jones may be very good as stand-off half, but he would be a great deal better if he would locate his three-quarters as the ball goes into the scrum so as to know where they are when the ball comes out. It is a much better method than taking the ball from the scrum half and then doing a long reconnaissance to discover the whereabouts of the three's, or standing still looking round like a kite-ballooning surveying a shoot.

Of the three-quarters C. N. Lowe and W. Jones are both excellent. Lowe is certainly the real star turn of the whole R.A.F., but he and W. Jones are so much of a size and so much alike in style that at a distance it is sometimes difficult to tell which is responsible for any one good piece of work when the play is at all tangled. Storrs is very fast, and the state of the ball on Saturday probably accounted for what on a good day might have been taken for a little unreliability about his hands. Bryson, on the left wing, did not seem to have much chance of distinction. The three-quarters might have made a more concentrated effort to smother Kershaw and Davies, but they seemed to be standing back in defence of their own goal, which was probably wise.

Haslam, the full-back, certainly atoned somewhat for his horrible display at the start by going down gallantly to various Navy rushes later in the day, but he is not in the same class as the Navy's back, and he is not fast, and his kicking seems uncertain. At the same time he looks as if he had the makings of a useful forward.

Taking it all round the R.A.F. might have done very much worse and it ought to have done very much better. It will be interesting to see when the Air Force plays the Army at Leyton how much it has learned from the Navy.—C. G. G.

The Air Force Team was:—Forwards, F/O. T. L. Lowe, F/O. J. E. L. Drabble, F/Lt. L. Whitworth, S/Ldr. W. C. Hicks, F/Lt. R. H. C. Usher, F/Lt. E. F. Turner, F/Lt. W. W. Wakefield and F/Lt. S. P. Simpson. Halves, F/Lt. J. C. Russell and F/O. J. I. T. Jones. Three-quarters, F/Lt. C. N. Lowe, F/O. W. Jones, F/Lt. O. C. Bryson and F/O. H. H. Storrs. Back, F/Lt. J. A. G. Haslam.

#### Henlow Notes.

HOCKEY.—Haltom "E" Team visited Henlow on Jan. 25th and knocked us out of the R.A.F. Cup by 2-1, in a very closely contested game. It rained in torrents, and the ground quickly cut up badly. No goals were scored during the first half. During the actual last minute of the game the visitors found a short corner from which the winning goal resulted. Our team was as follows:—Forwards, F/Lt. Peach, ACs. Lacey, Chapman, Osborne, Percival; Halves, ACs. Bushell, McDonald, Roberts; Backs, F/Lt. Anne, AC. Gunning; Goal, AC. Collier.

BEAGLES.—F/O. Pyper was so kind as to bring the R.A.F. pack from Uxbridge here last week. On Wednesday they met at Ramerwick, but a poor day resulted owing to the bad weather conditions. On Saturday the meet was at the Officers' Mess. The field included General Branker, Grp/Capt. Burdett, Wing/Cmdr. Hebdon, Wing/Cmdr. and Mrs. Blackburn, S/Ldr. and Mrs. Winfield-Smith, together with a number of other Station Officers, with their wives, and people resident in the neighbourhood. Hounds speedily found and it was soon evident that there was a tearing scent. Going over the plough was heavy. After a really sporting hunt of 55 minutes hounds ran into and killed their hare. Another hare was speedily forthcoming, and this time pass got away with it, hounds being brought home after 90 minutes' hunting, during which they changed hares.

SOCCER.—League matches were played last Saturday. "A" Team beat Dunstable 3-0. "C" Team beat Henlow 5-0.

Uxbridge visited us on the 1st and a somewhat cheerful charity match was played for the benefit of the R.A.F. Memorial Fund. There was a gate of round about 500. We all thought Uxbridge rather lucky to win by the odd goal. No doubt our opponents thought otherwise.

GENERAL.—A first-rate concert was given in the Cinema on Friday; all the artists were from the leading London Concert Halls and this sort of talent is thoroughly appreciated at Henlow.

Those who have left I.A.A.D. will be interested to learn that Serjt. Master-Tailor Fullon has retired after over 20 years' service in the Master Fusiliers and the Royal Air Force. He intends starting as a tailor in civil life and all our good wishes go with him. His "posh" snittings will be missed. The Astra Athletic Club was re-opened on the 2nd and is therefore once more available for the entertainment of visiting teams. The club has been re-decorated and is shortly to be extended by the addition of games rooms (billiards, etc.). A successful dance was held on Jan. 31st in aid of the R.A.F. Memorial Fund.

#### Uxbridge.

SOCCER.—At Uxbridge, R.A.F. Depot 6, Reading Amateurs

1. In this Great Western Suburban League match the Depot team showed excellent form despite the state of the ground, which was all against good play. F/O. Spooner was conspicuous for his fine spoiling work throughout the match; Sjt. Killick at centre-forward scored 4 of the Depot's goals.

On Jan. 28th the R.A.F. played Botwell Mission at Hayes. The Depot team went down 4-1 in this fixture, Botwell again proving what a stiff proposition they are for any team in the district.

HOCKEY.—At Uxbridge, R.A.F. Depot 2, St. Mary's Hospital 0.

RUGGER.—At Bedford, R.A.F., Uxbridge, v. Bedford School. The Depot took the field with 13 men, but despite this handicap made a good game of it, especially in the second half. Their defeat 15-3 was no disgrace.

#### The Central Flying School.

SOCCER.—The Central Flying School is running two football teams this season. The 1st eleven is in the Devizes and District League and their record in that league reads: Won 8, lost 1, drawn 1, goals for 39, goals against 3, points 17. The team has shown great keenness and is now playing very well indeed and are prospective champions of the League.

We beat West Lavington in the second round of the Devizes and District knock-out cup competition, and thus qualified to meet Bromham in the semi-final of that competition.

AC.1 White has scored 20 of the 39 League goals; he plays inside-left. Our centre-forward, Sjt. Wells, has scored 6.

The 2nd eleven are in the Pewsey and District League and hold 2nd position in that League. Their records read: Won 7, lost 5, drawn 0, goals for 26, goals against 16. Sjt. Dolbins has scored 6 of these goals.

SQUASH RACQUETS.—An Officers' Squash Tournament has been recently held at which there was a very good entry. F/Lt. H. H. M. Fraser won easily, although there were some very keenly contested games.

GOLF.—We have beaten H.O. No. 7 Group, drawn with No. 1 F.T.S., Netheravon, and lost to the Depot, Wiltshire Regiment, at Devizes. The golf course here is in excellent condition and both officers and men have shown great keenness in the game.

RUGGER.—F/O. T. L. Lowe has been playing regularly for the R.A.F. and F/O. J. A. Mansfield, M.C., has played in the R.A.F. trial games.

HOCKEY.—An Officers' Hockey Team has been formed and has played six matches. We have won three and lost three.

#### THE NEW PRESIDENT OF THE INSTITUTION OF AERONAUTICAL ENGINEERS.

It is announced by the Secretary of the Institution of Aeronautical Engineers, Mr. L. Howard Flanders, that Lieut.-Col. J. T. C. Moore-Brabazon, M.C., M.P., has recently been elected President of that Institution.

Lieut.-Col. Moore-Brabazon has had many years' intimate connection with motoring and flying, although still comparatively a young man. At an early age he took to driving fast cars and distinguished himself before the days of aviation by successes in various competitions, notably when he won the famous Circuit des Ardennes on his racing Minerva.

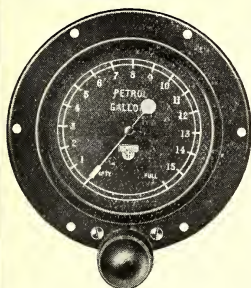
When flying first began in 1908 he took an active interest in it and bought one of the very first Voisin box-kite biplanes, which he called the "Bird of Passage," and brought it over to England. This was about the only passage that particular machine ever made, but on October 30th, 1909, he won the Daily Mail £1,000 Prize for being the first aviator to fly a closed circuit of a mile on an all-British machine, the aeroplane in question being a Short biplane with a Green engine.

Thereafter he did a great deal of experimental flying at the Royal Aero Club's aerodrome at Eastchurch, but he never appeared to any extent in public. At the outbreak of war he joined the Royal Flying Corps. He devoted himself to photography and a very large proportion of the wonderful progress made by the photographic section of the Royal Flying Corps and later of the Royal Air Force was due to Lieut.-Col. Brabazon's eminently practical knowledge of photography and aviation.

Col. Moore-Brabazon was awarded a Military Cross and was made a member of the Legion of Honour during the War. Soon after the War Col. Brabazon was elected Member of Parliament for Chatham and shortly after entering the House was appointed Parliamentary Private Secretary to Mr. Churchill, the Secretary of State for Air. He resigned that office a few months ago so that he might have an absolutely free hand in constructive criticism of the Air Ministry and of the Government policy towards aviation.

The Institution of Aeronautical Engineers is to be congratulated on having acquired as its President one of the ablest of the many able young men concerned with British aviation. The excellence of the appointment is increased by the fact that Col. Brabazon is also a member of the Council of the Royal Aeronautical Society, and so will be in a position to adjust in a friendly way any divergencies of opinion or overlapping of interests between these two important associations.





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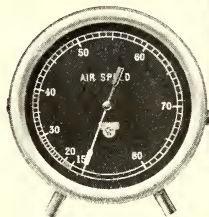
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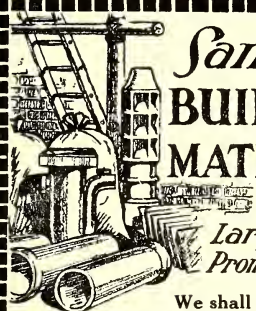
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[The following table of arrivals at and departures from the British Air Ports is compiled on the following system:—First comes the initials of the Air Line; next the type of machine; next the international number of the machine; next the ports of departure and destination; next the times of departure and arrival; next the cargo, whether goods (G) and/or mails (M); next the number of passengers; and finally the name of the pilot and number of mechanics, if any.]

ABBREVIATIONS:—A.D.—Aircraft Disposal Co. B.A.—Berkshire Aviation Co. B.C.—Bristol Civil Aviation Co. B.M.—Brompton Motor Co. C.A.—Department of Civil Aviation D.H.—De Havilland Aircraft Co. G.E.—Compagnie des Grands Express Aeriens. H.P.—Handley Page Transport Ltd. I.L.—Instone Air Line K.L.—Koninklijke Luchtvaart Maatschappij. L.A.—Leatherhead Aviation Service. M.A.—Messageries Aeriennes. M.W.—Marconi Wireless Telegraph Co. Ltd. P.O.—Privately owned. P.L.—Petters Ltd. S.F.—Surrey Flying Services S.N.—Syndicat National pour l'Etude des Transports Aériens (S.N.E.T.A.).

### The London Terminal Aerodrome, Croydon. (Telephone: Croydon 2720.)

#### JANUARY 30th:

I.L., DH18, G-EARO, London-Paris, 12.15-14.45, G.M., 2, Robins & 1. M.A., Spad, F-ACMI, London-Paris, 12.25-15.05, G., Nil, Le Men. G.E., Goliath, F-LEAD, London-Paris, 12.27-15.16, G., 6, Gastoux & 1. H.P., DH4, G-EAWH, London-Paris, 12.35-14.55, G.M., 2, Wilcockson. H.P., HP, G-EATH, Paris-London, 11.00-14.45, Nil, 4, Rogers & 1. I.L., DH18, G-EAWW, Paris-London, 12.10-11.30, G., 4, Powell & 1. G.E., Goliath, F-ADDT, Paris-London, 12.18-15.35, G., Nil, Favreau & 1. M.A., Spad, F-ADAF, Paris-London, 12.55-15.30, G.M., 2, Perignon.

#### JANUARY 31st:

M.A., Spad, F-ACMG, Paris-London, 15.10-14.11/1st, G.M., 2, Paillet.

#### FEBRUARY 1st:

M.A., Spad, F-ACME, London-Paris, 12.20-14.47, G., Nil, Perignon. I.L., DH18, G-EAWO, London-Paris, 12.23-14.55, G.M., 4, Holmes & 1. G.E., Goliath, F-ADDT, London-Paris, 11.45-14.26, G., Nil, Favreau & 1. H.P., DH4, G-EAWH, Paris-London, 11.15-13.58, Nil, 2, Wilcockson. G.E., Goliath, F-LEAO, Paris-London, 12.17-15.37, G., 2, Chalmers & 1. I.L., DH18, G-EARO, Paris-London, 12.30-15.37, G., 7, Robins & 1. M.A., Breguet, F-CMAO, Paris-London, 13.10-16.20, G.M., Nil, Charpentier.

#### FEBRUARY 2nd:

NIL.

#### FEBRUARY 3rd:

I.L., DH18, G-EARO, London-Paris, 13.45-15.55, G.M., Nil, Robins.

#### FEBRUARY 4th:

NIL.

#### FEBRUARY 5th:

I.L., DH18, G-EAWW, London-Paris, 12.17-14.30, G.M., 3, Courtney & 1. M.A., Breguet, F-CMAO, London-Paris, 12.18-14.50, G., 4, Charpentier. I.L., DH18, G-EARO, Paris-London, 12.15-14.50, G., 2, Robins & 1. I.L., DH18, G-EAWO, Paris-London, 12.16-14.50, G., Nil, Holmes. G.E., Goliath, F-ADDS, Paris-London, 12.29-15.55, G., 2, Labouchere.

### Inland Flying at Croydon.

Jan. 30th.—M.W., Avro test (Shaw).

Jan. 31st.—Nil.

Feb. 1st.—M.W., Avro tests (Shaw); R.A.C., Avro tests (Vincent);

I.L., Vimy tests (Cockerell).

Feb. 2nd.—R.A.C., Avro tests (Vincent).

Feb. 3rd.—D.H., DH19 from Stag Lane (Payne); R.A.F., DH13 from

Martlesham (Ordnance).

Feb. 4th.—Nil.

Feb. 5th.—I.L., Vimy and DH18 tests (Powell and Barnard); H.P.,

HP from Bristol (Olley & 1); B.C., Bristol from Bristol (H.P.).

### Cross-Channel Statistics.

Week ending February 5th:—

Machines, 22; Passengers, 42; Crews, 33; Total Personnel, 75

Corresponding week last year:—

Machines, 15; Passengers, 8; Crews, 14; Total Personnel, 22

### The London Terminal Aerodrome.

A report appeared in all the papers last Monday to the effect that the Aircraft Disposal Company had sent off several machines to Belgium and they all crashed. This is quite incorrect. Actually what happened was as follows:—Messrs. Muir, Stocken, Elton, Herne, Hayns and Forrester-Walker all had machines to deliver. The weather round Brussels was impossible with fog. Mr. Forrester-Walker, as stated last week, crashed just outside the aerodrome and Mr. Elton turned his machine over on its back owing to being forced by weather to land in plough. Messrs. Muir, Stocken and Herne all got through to Brussels when the weather cleared and Mr. Hayns landed at Lympne with engine trouble and returned to Croydon on Sunday last. He was flying the same "crashed" Stipe all through the Air Conference visit.

On Wednesday last a Spanish Naval official of high rank visited the Disposal Company to inspect some machines for his Government. He looked rather like a Spanish edition of Sir Eric Geddes. Mr. Muir demonstrated a two-seater F.1 Martinsyde, doing some speed runs across the aerodrome during which the speed indicator showed 140 m.p.h.

The same day a Parnall "Panther" arrived by rail and is now being assembled in the shed. It should be out very shortly.

Various D.H.18s, Goliaths, etc., have been as usual on the air lines.

On Thursday the Gloucestershire Aircraft Company's "Bamel" arrived by road from Martlesham and was erected in the Handley Page shed. It was found that one of the undercarriage fittings was bent and an urgent message was

sent to Cheltenham for a spare. This was immediately sent off and the machine was duly erected. The Bamel on this occasion was fitted with her touring wings which she wore in the Derby. The others were also brought down in case, (in both meanings). They are 40 sq. ft. less in surface. The Titanite racing finish was much admired by all.

"Mr. and Mrs. Longden were at the aerodrome on Monday, as was Mr. Folland, and all were pleased with the complimentary remarks on the magnificent appearance of the machine.

On Friday a D.H.14 with a Rolls-Royce "Condor" arrived from Martlesham and soon after this Mr. Payne came in on the D.H.29. This machine is extremely pretty in the air and it was entirely stupid of the Department of Civil Aviation to prevent its flying on Monday.

On Saturday it was snowing hard all day and the only machine to fly was an R.A.F. Bristol which passed over the aerodrome from the direction of Kenley, but on Sunday Mr. Bunker came in from Southampton on the Avro-Lynx, followed shortly after by Mr. Olley on the O/400 fitted with the Bristol "Jupiter" engines. The speed of the machine is much increased, as is its climb.

About half an hour later Mr. Uwins came in on the Bristol ten-seater (Napier). The machine is now finished and has been handed over to the Air Ministry, so doubtless it will now be allotted to an air line.

The "Vimy" has been fitted with a pair of new Rolls-Royce "Eagles" and Mr. Barnard was testing her on Sunday afternoon. Two D.H.18s came in together from Paris flown by Messrs. Robins and Holmes.

# INSTONE PAR LINE

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On Monday a buff-coloured "Goliath" came over from Paris; this was one of the new "Goliaths" which the Cie. Messageries Aeriennes are running this year.

Mr. Muir has been flying the Surrey Avro and Mr. Grant has been erecting new Avros with Renault engines. One of these is for Mr. Derwent Hall-Caine.

Mr. Shaw has been flying the Marconi Avro quite frequently and Mr. Vincent has been up on various Royal Aero Club Avros.—G. D.

### Things People Want to Know.

Whether the Cardinal (As you were—the Colonel) purposely wore his flying hat in such a way as to make it look like the standard Papal mitre?

Whether the "Jupiters" have been installed to help the machine surmount the new fence?

Whether "O" in O/400 stands for "old"?

Whether that which Major Grant said aient the crash 'is to be made into a standard monologue for serjeant-majors?

Whether "Ma's first" was a he or a she?

Whether the standard uniform for other members of the Independent group will be "plus fours" like the leader?

Whether it is correct, when wearing the uniform of a certain air line, to raise the hat in salutation?

And whether the uniform was mistaken at the London Coliseum for that of a commissionaire?

Where Mr. D—s M—y got the expensive looking spectacles?

### Brooklands.

A "Viking IV" is being specially constructed and modified at the Vickers Works for the proposed attempt to be made by Sir Ross Smith to fly round the world.

Several "Vernons" (large weight-carrying machines) have been tested at Brooklands recently.—J. F. S.

### Addlestone.

One is informed on good authority that the Air Navigation and Engineering Co. Ltd., of Addlestone (formerly known as Blériot's), whose works have been lately practically idle, and who manufactured the Blériot "Whippet" light car after producing many fighting aeroplanes during the war, have received a contract from the Handasyde Aircraft Company to construct a machine for the Australian Government, presumably the commercial monoplane of Mr. Handasyde's design. For this purpose a number of hands have been engaged.—J. F. S.

### THE CAIRO-BAGHDAD AIR MAIL.

The Postmaster-General states that the Air Mail which was despatched from London on Jan. 12th reached Baghdad on Jan. 20th. The mail due to be despatched by air from Baghdad on Jan. 21st reached Cairo on Jan. 27th, and letters included in it for this country should have arrived in London on Friday last, Feb. 3rd. The reason for the air mail taking seven days from Baghdad to Cairo is not explained.

The next Air Mail to Baghdad will be despatched from London on Thursday, Feb. 9th.

### THE INSTITUTE OF TRANSPORT.

The fourth ordinary meeting of the Institute of Transport for the current session will be held at the Institution of Civil Engineers, Great George Street, Westminster, S.W.1, at 5.30 p.m., on Monday, Feb. 13th, 1922, when a paper will be read on "The Development of Commercial Airways" by Sir Henry White-Smith, C.B.E. (Member). Tickets may be obtained from the Secretary, 15, Savoy Street, Victoria Embankment, W.C.2.

## PERSONAL NOTICES.

### ENGAGEMENTS.

RAPER—CONYNGHAM.—A marriage has been arranged, and will shortly take place, between the Marchioness Conyngnam, daughter of the late W. A. Tobin, of Wingadee Station, New South Wales, and of Mrs. Tobin, and Mr. A. Baldwin Raper, M.L., son of Mr. Walter Raper, of Gerrard's Cross.

WARING—MORRISON.—The engagement is announced between Rupert T. T. Waring, late R.A.F., elder son of the Rev. and Mrs. C. T. Waring, of Sydenham, and Jean, eldest daughter of Mr. and Mrs. Charles Morrison, of "Northcotes," Sydenham.

### MARRIAGE.

DIRCKS—COBLEY.—On Dec. 22nd, at the Memorial Cathedral, Mombasa, by Rev. E. W. Crawford, Chaplain, E. Dircks, late R.A.F., Dept. of Agriculture, Kenya Colony, son of Mr. J. F. W. Dircks, East London, The Cape, to Walwyn St. Clare Cobley, daughter of Mr. W. H. Cobley, I.S.O., late Natal Civil Service, Maritzburg, Natal.

### BIRTHS.

GORDON.—On Jan. 30th, at The Milton, Monifeth, Forfarshire, the wife of Grp/Capt. R. Gordon, C.B., C.M.G., D.S.O., R.A.F.—a daughter. McCLEAN.—On Feb. 3th, at 12, Prince's Gardens, S.W., to Aileen, wife of Lieut.-Col. F. K. McClean—a daughter, who died the same day.

SAVILLE.—On Feb. 2nd, at Ashmanhaugh (Nursing Home), Chiltonville, Margate, Hildred, the wife of F.O. F. C. B. Saville, R.A.F., Munster—son.

WIFE VILEY.—On Jan. 26th, at Simla, to Dorothy, (nee Hodgkinson), wife of Lt. Eric S. Wicatley, D.F.C., R.A., of The Knoll, Farnham—a son.

## PRIZE FIGHTS & PARACHUTES

But what have they to do with one another?

### Carpentier's Knockout Blow to Cook.

The lightning-like quickness of Carpentier's second winning prize, as Cook was falling, raised doubts about it. It was delivered before or after Cook actually reached the ground. In high-speed movement the human eye is very liable to be deceived. It is especially untrustworthy as to whether quick movements are synchronous or desynchronised, and in deciding at successive points of time the relative positions of unlinked mechanisms. The eye of the Cinema Camera is under no such disability and produces a perfect record of time and position of all it gathers in. Here the decision was of the most vital importance—foul or no foul? Carpentier or Cook? The referee fortunately was right, and the Cinema pictures prove, to those who thought otherwise, by exactly how much he was right.

Probably the great value of the accuracy of the Cinema record has never before been so prominently brought to the knowledge of the public; but from the beginning of 1915 its accuracy has been utilised in the study of the successive developments of

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Fairey Aviation Co., Ltd., The, Hayes, Middlesex. "Airlily," Hayes, Middlesex. Hayes, Middlesex 19 .....	95
Farnall, George, & Co., Colson Works, Park Row, Bristol. "Warplanes," Bristol. Bristol 473 (2 lines) .....	106
Roe, A. V., & Co., Ltd., Newton Heath, Manchester. "Triplane," Manchester. City 33601, Manchester .....	Inside Front Cover
Short Brothers (Rochester & Bedford), Ltd., Scaplane Works, Rochester, Kent. "Scaplanes," Rochester. Chatham 627 .....	Inside Back Cover
Supermarine Aviation Works, Ltd., The, Southampton. "marin," Southampton. Woolston 37 (2 lines) Inside Back Cover	
Westland Aircraft Works, Yeovil. "Aircraft," 141 Yeovil. Yeovil 141 .....	103

## AIR LINES.

Instone, S., & Co., Ltd., 51, Lendenhall Street, London, E.C.	
Avenue 36167-8 .....	108

## AIRSCREWS.

Falcon Airscrew Co., The, 113, Cottenham Road, Holloway, London, N.19. Hornsey 310 .....	Front Cover
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## BUILDING MATERIALS.

Sankey, J. J., & Son, Ltd., Essex Wharf, Canning Town, Lon- don, E.16. "Sankey," Canning Town. City 5677 (2 lines) ..	109
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## DOPES.

Cotton (Richmond) Ltd., 22, Cork Street, London, W.1. "Ajawb," Reg. London. Gerrard 440 (2 lines) .....	111
Titanite, Ltd., Empire House, 175, Piccadilly, London, W.1. "Tetraflex," Piccy, London. Gerrard 2312, Regent 4728 .....	Front Cover & 101

## ENGINES.

Armstrong Suddely Motors, Ltd., Coventry. "Sidarm," Coventry. Coventry 954 .....	106
Bristol Aeroplane Co., Ltd., The, Filton House, Bristol. "Avi- ation," Filton. Bristol 596 .....	Back Cover
Nauier, D., & Son, Ltd., 14, New Burlington Street, London, W.1. "Nitrier," London. Gerrard 3626 (4 lines) .....	97
Sunbeam Motor Car Co., Ltd., 24c, Wolverhampton. "Moor- field," Wolverhampton. Wolverhampton 985 .....	98

## INSTRUMENTS (Speed Indicators, etc.).

Smith, S., & Sons, Ltd., 171-185, Great Portland Street, London, W.1. Mayfair 6556 (6 lines) .....	100
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## MAGNETOS.

British Thomson-Houston Co., Ltd., The, Rugby. "Asteroidal," Rugby. Rugby 286 .....	105
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## PARACHUTES.

E. R. Calthrop's Patent Patents, Ltd., 423 & 423A, Edgware Road, London, W.2. "Savemalivo," London. Paddinton 6332 .....	111
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Accles & Pollock, Ltd., Oldbury, Birmingham. "Accles," Old- bury. Oldbury 111 .....	109
--	-----

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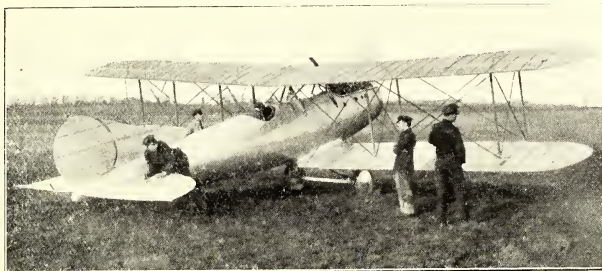
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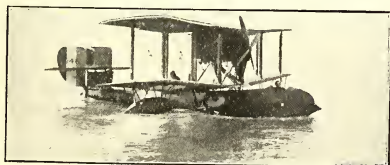
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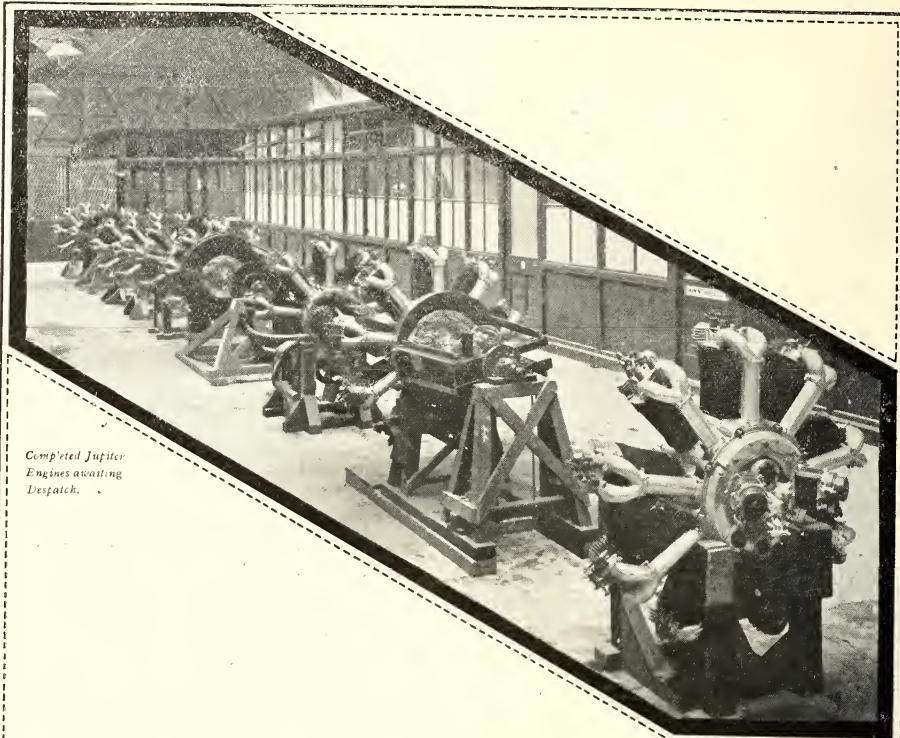
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WEDNESDAY, FEB. 15, 1922.

Edited by  
C. G. Grey

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SIXPENCE WEEKLY.

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## AT THE CROYDON "RALLYE."



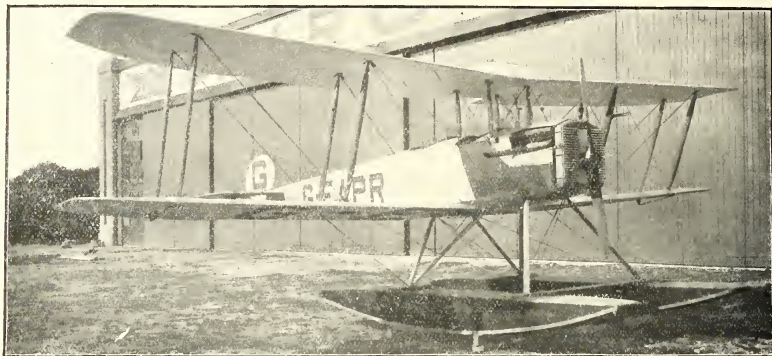
INTERESTING VISITORS.—Here are seen some of the machines which visited Croydon for the Air Ministry's gathering on Feb. 6th, in connection with the Air Conference. Few people outside the aeronautical community were present, so the time, petrol, wear and tear of bringing and flying the machines were largely wasted. The machines shown are: Top, the new D.H.29 and the Gloucestershire Co.'s "Mars I" (Bamel), both with Napier engines. Middle, the Bristol ten-seater, Napier engine. And at bottom, the Westland "Limousine" and the Vickers "Viking" amphibian, both with Napier engines.

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# THE AEROPLANE

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## ON THE AIR CONFERENCE.

Taking it all round the Air Conference was a much more amusing affair than anybody expected it to be. Whether it will have any ultimate effect, good, bad or indifferent, on anybody concerned is a matter which nobody can decide.

The Press, as everybody expected, with a few honourable exceptions, seized on all the points which really did not matter and omitted many of those which were of vital importance. At the same time, the Press "showed willing" and devoted quite a lot of space to the speeches, and as the speakers nearly all talked sound sense all the time the newspapers were obliged to print a good deal of sensible matter. The only question is whether the Great British Public took the trouble to read any of it.

As Mr. Handley Page remarked in his wittily sarcastic way, the fact that all the papers told the story of "the bride in tears" gave those of us who were at the Conference some gauge of the mental level of the aforesaid British Public. That of course was merely Mr. Handley Page's way of sizing up the mental level of the people who misconduct our newspapers. As a matter of fact the average mental level of the Great British Public is really a trifle higher.

So far as the great majority of the speakers at the Conference are concerned one is rather in a difficult position. Apparently all of them read THE AEROPLANE with consistent assiduity. At any rate an enormously high percentage of them quoted the opinions of THE AEROPLANE at considerable length, or at any rate pronounced opinions which are precisely those which have been expressed in THE AEROPLANE time after time for the past six months or six years. Consequently one is relieved of the necessity for, or deprived of the pleasure of, disagreeing with most of the speakers.

Of course the explanation of this singular unanimity may be merely that THE AEROPLANE is fulfilling efficiently the duty of holding a mirror up to nature and thus reflects consistently the views of the best people connected with aviation. Natural modesty suggests that really this is the true explanation. Be that as it may, the fact remains that a very great deal of sound common sense was talked at the Conference both by the lecturers and by those who took part in the discussion on the second day.

### The Procedure.

The procedure was curiously arranged in that all the papers were read in one day and that all the discussion took place on the second day. This was really rather a good idea, as it gave those who wished to take part in the discussion the opportunity of sleeping on their impressions. It may account for the fact that the discussion on the second day was singularly interesting. But one imagines that the interest of the discussion was also aided by the fact that the Chairman called by name upon the various speakers who had previously sent in a request to be allowed to speak.

This had the excellent result of preventing cranks and self-advertisers from boring the assembly, as happened at the first Conference. Of course it did not prevent some of the speakers from advertising themselves or from boring the assembly, as was shown by the way the room cleared when certain people rose to speak, but at any rate it did limit the amount of boredom, which only amounted to about enough to act as relief to the striking or scintillating utterances of others.

### The Programme.

The programme really began with the official visit to Croydon on Feb. 6th. This was adequately described by Mr. Geoffrey Dorman in last week's issue of THE AEROPLANE, and a few pictures of the affair appear this week.

On Tuesday the Conference proper was opened by a paper on "Civil Aviation" by Lord Gorell, C.B.E., M.C., the Under Secretary of State for Air. He was followed by Lieut.-Colonel W. A. Bristow of Ogilvie and Partners Ltd. on "Aerial Transport To-day and To-morrow." These occupied the morning session.

In the afternoon Captain F. M. Green, late of the Royal Aircraft Factory and now of Armstrong Whitworth Aircraft Ltd., read a paper on "Research from the Designer's, Constructor's and User's Point of View." He was followed by Brigadier-General R. K. Bagnall-Wild, C.M.G., C.B.E., the

new Chief of the Aeronautical Inspection Department, with a paper on "The Progress of Research." This was followed by Major G. H. Scott's paper on "Airships."

The purely technical sides of these various papers will be dealt with by Captain Sayers in the "Aeronautical Engineering" Supplement.

Editorial comments on the remarks of speakers appear in brackets.

### Captain Guest's Healthy Pessimism.

The actual proceedings of the Conference were opened by the Lord Mayor on Feb. 7th.

Captain Guest, Secretary of State for Air, took the Chair at the first session. In his opening remarks he said that the object of the Conference was mainly to encourage Civil Aviation. The slowness in progress was due first to depression in trade and secondly to the danger in flying which still remained. Nevertheless our safety line was the highest in Europe. During the past year nearly 50,000 people had been carried in the air, there had been 25,000 flights and only two fatal accidents had been recorded.

He had to admit that so far as airships were concerned the outlook was not hopeful. One of our great Dominions had consented to join an Imperial airship scheme, but New Zealand and South Africa refused owing to the state of trade. As to the complaint that we were losing our lead in this connection he suggested that the information regarding developments in other countries had been greatly exaggerated.

He believed that it would be many more than three years before there was sufficient money to spare to undertake a commercial airship venture. If the period were say ten years and if people thought that the Government should find a heavy subsidy to keep airships going he submitted that it would be cheaper to start all over again at the end of that period.

Furthermore, he believed that taking the long view of aircraft traffic in general there was little or no prospect of a real success being obtained in Europe. England itself had shown that the railway system was so good as to render aircraft unattractive and unprofitable from a commercial point of view. He thought that was true of all Europe generally and to a lesser extent of America, and they could not expect too much from the cross-Channel service from a commercial point of view, as it was competing with a highly developed system of rail and boat service, so that aircraft would be defeated by the regularity and punctuality of the older form of service.

To counterbalance this was an extremely bright outlook so far as the British Empire was concerned abroad owing to the great spaces unapproachable except by sea. He could see the possibilities of Imperial air communications on lines already suggested.

The tone to be adopted at present was one of sure, simple, but not extravagant, optimism. The time should be spent as it had been in the last two years in strengthening co-operation between the Air Ministry and the Aircraft Industry. Their motto for the next year should be "Sit tight, work hard, don't stunt and be ready for better times."

[On the whole one agrees with Captain Guest's sentiments, though they were frequently called pessimistic by people at the Conference. Where one disagrees with him is in his opinion that there is no real commercial success to be obtained in Europe and certainly not in England. It is true that looking at things from Captain Guest's point of view, which is necessarily not that of a technical man, he is undoubtedly right, but, knowing the possibilities which exist for the improvement of aeroplanes and engines and the consequent cheapening of air transport, with at the same time equally great advances in the safety of flying and in the ability to start from and alight in small areas, one believes that air transport eventually will be a very paying business, not only in Europe where the train services are bad and slow compared with our own but in England itself which has undoubtedly the best railway system in the World.

If experiment and research is carried out along proper lines with sufficient vigour it should be possible within five

years to travel by air at approximately first-class railway fare with the immense advantage of travelling direct from place to place. One does not imagine that air services will compete with the railway between London and Glasgow, but it must be remembered that practically all railways run radially from London with a few slow and badly served cross lines and consequently air-taxi work developed from joy-riding with proper machines will become a very paying proposition. The Berkshire Company's experiment at Birmingham was merely five years in front of its time.

Furthermore, by adopting a deliberately pessimistic tone at the opening of the Conference Captain Guest, whose knowledge of the English nature is obviously considerable, stirred up the Englishman's naturally contradictory spirit and so produced an atmosphere of determined optimism which would certainly not have pervaded the Conference if he had started by being optimistic.]

### Lord Gorell's Sound Sense.

Lord Gorell's paper on Civil Aviation was eminently sound, and the fact that he should have absorbed so much actual knowledge and so much of the spirit of aviation in the short time that he has been connected with the Air Ministry is a most encouraging sign for the future. He referred to the increased interest in aviation on the part of the British Public but stated frankly that we have not as a people shown the general interest which is being shown in other countries, notably in France.

He did not agree with the view that the Service and Civil sides of flying are necessarily in conflict. They should be more truly regarded as complementary to one another, as in the relation of the Navy to the Mercantile Marine, and he believed research to be the essential link between Service and Civil flying. He did not pretend to technical knowledge and remarked that probably in the position which he held it would be a disadvantage to pretend to any degree of technical qualifications, but it seemed to him that the requirements of the Service fall into two main categories, the first for the actual purposes of war, the second the ancillary services connected with movement and supply, and he thought that all improvement in Service machines under the second category would be a direct service to Civil Aviation.

Those trained in civil flying would in case of need supplement the work of the Royal Air Force and he believed that the suggested organisation of an Auxiliary Air Force would be a further and valuable link between the R.A.F. and Civil Aviation. Further it seemed to him that some such system would have the effect of diffusing among the general population the sense of the air as a practical means of communication, which he deemed to be of paramount importance in developing aerial activity.

### Consistency and Newspapers.

Referring to the attitude of the Press towards airships, Lord Gorell remarked that a newspaper had one great advantage over a government in that it need not trouble to be consistent, consequently last Summer one found papers voicing in one column the national demand for strictest economy and in another denouncing the Government for closing down the Airship Service. The whole question depended on whether we could afford airships while we are poor, for few deny the probability of the World being ultimately connected up by such services in the future.

It was estimated by a committee appointed for the purpose that £8,000,000 would be necessary to keep a suggested airship service going for five years. The decision to close down was taken purely on financial consideration and he was impressed on entering the Air Ministry in July last by the anxiety on the part of those concerned to discover if possible some practicable means of maintaining the service. In view of the activities in other countries the suspension of activity in this country based solely on present financial conditions could have no finality.

### A Welcome Law.

Lord Gorell then turned to Aviation and quoted a number of interesting figures demonstrating the progress of Civil Aviation in other countries, particularly emphasising French progress.

He also made known the fact that regulations have recently been framed under the Air Navigation Act providing for the investigation and notification of accidents not only in the United Kingdom but to any British aircraft registered in the British Isles. The Court of Investigation will have power to summon witnesses and to require them to produce information and documents.

[One may state here that this is an entirely praiseworthy move, and one which was advocated in THE AEROPLANE many months ago.]

### Figures and Motives.

According to the figures quoted by Lord Gorell between Jan 1st and Dec 31st, 1921, civil aircraft in France made

5,115 flights, flew 14,100 hours, covered 1,145,500 miles, and carried 8,761 passengers, with 126 tons of goods. Unfortunately he did not quote similar figures for Great Britain, but he stated that during the Summer months more passengers were carried in British machines than in French machines.

He said that although more flying is being done in France than in this country that is not in itself to say that the French policy is right and ours is wrong. The French have spent 33,000,000 francs and are about to spend 46,000,000 francs on subsidising Civil Aviation and yet he found fairly general agreement that in design and construction the French have not advanced as might have been expected.

He was certain at any rate that a lavish policy of subsidies, though it must produce striking results in the way of miles flown and lines opened, might not really be successful in producing permanent results. He did not intend to criticise the French policy, but only questioned whether it should be applied to this country. What suited one nation might not suit another. It might even be that the ends desired were not the same, one nation having immediate objects in view might take measures to achieve them even though these measures might not greatly assist an ultimate object. [One presumes that the reference here is to the French craze for maintaining an enormous air fleet for Germanophobic reasons.] From the British point of view the first and greatest factor must be to produce in the public mind a sense of safety and personally he felt no doubt that in this respect British machines at present led the field.

### Cross-Channel Services.

Referring to the cross-Channel services Lord Gorell said that during the seven months in which the Handley Page and Linstone Air Lines had been in operation they carried from London to Paris, 2,356 passengers and from Paris to London 2,140, a total of 4,496. The French companies carried from London to Paris 1,861 passengers and from Paris to London 2,081, a total of 3,942. It was interesting to note that the average for each British machine was six passengers and the average for each French machine was about two. Also, throughout the whole of this period there was no casualty on any British machine.

[One may note here that all of the cross-Channel passengers about 5 per cent are French and about 40 per cent American, the rest being British and assorted nationalities. Which seems to have an interesting bearing on Lord Gorell's previous remark that public interest in aviation was stronger in France than in England. Interest in any given thing does not necessarily imply faith in it.]

During the current year they would have three lines operating on the London-Paris route in spite of criticism in some quarters to the effect that a third line would diminish the chances of commercial success for all three.

### A Remedy for the Subsidy Evil.

Lord Gorell said that there was a real danger that any policy of subsidisation might result in the maintenance in the air of obsolete or obsolescent machines. To fight this the Government had agreed for the present year at any rate that machines rented to the air lines would if returned in an air-worthy condition be taken back after only nine monthly payments of 2½ per cent. of their value, so that they might be replaced by later types of machines. [This is a wholly praiseworthy decision and is fully in accord with the somewhat violent opinions frequently expressed on this subject in this paper.]

Lord Gorell further said that of the £200,000 allocated to the cross-Channel service approximately half would be spent on buying new machines. Personally if it were financially possible he would like to see a service across the Irish Channel, for it was no less important from a psychological point of view to do away with the idea of the sea lying between England and Ireland than it was in the case of France. Such a service would come in due course if not in the immediate future.

### The Air Mail Fiasco.

After considerable reference to Imperial Air Routes and to air mail systems in general Lord Gorell commented on the fact that the Public did not realise the use of air mails, as was proved by the fact that though it is possible to send letters from London to Baghdad by air fewer letters go from London to Baghdad than come from Baghdad to London. He suggested that the proximity of the desert had brought within the mental vision of people the advantages of aerial transport than had so far been gained by people in London.

It reminded him of the two ladies, one living in Golders Green and the other Kensington. The former visited her more distinguished friend who in response to an invitation to return the visit excused herself because of the distance she would have to go. Whereupon the former with some spirit



remarked that it was just as far from Golders Green to Kensington as it was from Kensington to Golders Green. Lord Gorell suggested that the newspapers should make more use of air lines for the distribution of their products. It might be possible ultimately to have the *Times* for breakfast in the North of Scotland.

As to subsidies in general Lord Gorell said that probably the action of any Ministry in any Government falls short of what enthusiasts desire. It was always possible for any enthusiast to take a telescopic view which brought a distant object nearer by a concentration of vision which excluded consideration of the situation which immediately surrounded him.

Consequently in the present extreme necessity for public economy it was idle to expect that more money could be devoted to subsidising Civil Aviation. It was not fair to contrast the greater amount of flying in France with what was being done in this country unless one was prepared to support similar allocations of money and he was sure that no degree of public support would be given to a proposal that we should spend a million pounds on this object. This country was endeavouring to pay its way and so must postpone expenditure on many things in themselves highly desirable.

### The Aviation Advisory Board

Finally Lord Gorell announced a manner in which the present cost and practicability generally of an Imperial mail service would receive examination. A Civil Aviation Advisory Board would be appointed with the Under Secretary of State for Air as Chairman.

The Membership would comprise: the Controller-General of Civil Aviation, the Director-General of Supply and Research, together with, it was hoped, representatives of the General Post Office, the Associated Chambers of Commerce, Lloyd's, the Royal Aeronautical Society, the Air League of the British Empire, the Royal Aero Club, and the Society of British Aircraft Constructors.

In addition, the most convenient way of securing representation of the Dominions and Crown Colonies was being considered, and they would in any event be consulted whenever the interests of any were concerned. He was further authorised to say that the Secretary of State had decided to refer the Advisory Board the first subject upon which he desired its recommendations, the question of the cost and practicability of an Imperial Air Mail Service.

[One suggests that to this Board should be added a representative of the Insurance interests, which is not precisely the same thing as Lloyd's, and a representative of the Institution of Aeronautical Engineers, which is by no means the same thing as the Royal Aeronautical Society.]

### Technical Affairs.

The papers read by Colonel Bristow, Captain Green and Brigadier-General Bagnall-Wild will be discussed from the purely technical point of view by Captain Sayers in the Aeronautical Engineering supplement of *THE AEROPLANE* this week and hereafter. One need only say that all three of them were thoroughly sound and deserve to be studied minutely by those who are professionally concerned with the technical side of aviation.

In the happy days of the War when the Aircraft Industry was flourishing it would have been possible to reproduce them fully in *THE AEROPLANE*, but under existing circumstances it cannot be done. Therefore one recommends those who are immediately interested in them to make sure of obtaining the verbatim report of the whole Conference, which will be published by His Majesty's Stationery Office in due course.

### Airships.

Major Scott's paper on Airships was on the same sound level as the other papers, though naturally he was a special pleader and was more concerned with the pros of airships than with the cons. He stated that technically the airship of to-day could be usefully employed for commercial purposes without waiting for further improvements. And that given the establishment of proper bases and mooring masts it was the most promising means of speeding up Imperial communications, which, of course, is perfectly true. He also added that with bases and masts the airship of to-day would become through its greatly increased mobility a vital factor in national defence.

[With this dictum one cordially disagrees. It is quite possible that the airship of to-morrow might become a vital factor in national defence, but no airship of to-day considered from a war-like point of view is any more valuable than were the German airships in the recent War, and the failure of the German airship raids in 1918 proved definitely that for purposes of offence the aeroplane was superior in attack to any possible defence which could be set up by airships. Consequently the airship can only be used in war against countries which are not equipped with aeroplanes or adequate anti-aircraft defences on the ground.]

Also one very much doubts whether existing airships, or even any airships which could be built with existing knowledge, are capable of performing on the England-India-Australia route with the regularity of steamships. And if they cannot do so then it is better to wait till we can afford to build experimental airships and develop them to the point when they can do justice to themselves on that route. It will be much cheaper in the end to let America and Germany and Spain experiment with airships for the next few years and then profit by their experience. At the present moment the aeroplane is much more vital to our scheme of defence.]

### THE DISCUSSION.

The second day of the Conference, Wednesday, Feb. 8th, was in a way more interesting than the first day, in that it brought out a number of opinions of very varied degrees of experience and intelligence.

Lord Weir, who opened the proceedings, said that the achievements of the last three years compelled them to confess a very meagre result. The aeroplane had been unable to demonstrate a utility commensurate with its cost for any purpose whatever except for the cross-Channel services.

State funds had enabled miscellaneous aircraft to fly more or less irregularly over certain routes carrying relatively small commercial loads. Briefly, the existing aeroplane was not an instrument capable of achieving results of value commensurate with the expenditure involved. The problem was still one for scientists, designers and constructors, and these had never yet failed so long as they were fed with sufficient field experience and definite practical demands on which to base their work.

### A Veiled Attack on the Air Force.

Major-General Sir Frederick Sykes, Controller General of Civil Aviation, who opened the discussion, asked whether aviation was one of those luxuries which we could afford to forgo.

Speaking as a soldier who at the end of the War held the post of Chief of the Air Staff, he said that the air materially helped to win the War if it did not actually do so. Next time it would be the same only more so. Great Britain and the Empire were no longer protected by their engirdling seas.

He quoted Admiral Mahan as saying that sea power is based on a flourishing industry. In the air the analogy was still true, but the Air Force itself was not air power, it must have reserves, and these would in future be supplied by Civil Aviation. The wise man when peace was declared cut his armed forces down to a minimum which might form a nucleus in case of need and sent the others out of trade. It was the development of peace attributes which were in true accord with the agreements made at Washington.

General Sykes said that peace and commerce never yet looked well tied to war's chariot. As Controller General of Civil Aviation he pleaded for something greater than a measure of financial support, namely, that it should be considered whether the surest method of developing Civil Aviation did not lie in freeing this potential asset of the British Empire from the blighting incubus of military end-all and be-all. He asked whether (a) aviation is a necessity of our national life and therefore to be afforded at any cost; (b) Service Aviation can exist without its Civil counterpart; and (c) how best to develop Civil Aviation?

[Making all allowance for the fact that General Sykes' duty as Controller General of Civil Aviation is to foster Civil Aviation at all costs one cannot but think that he has taken an extremely wise step both in his own interests and in the interests of Civil Aviation by making this veiled attack on those who control the policy of the Royal Air Force. Whatever progress has been made in aeroplane and aero-engine design during the past two or even three years has been made thanks to the Royal Air Force. And so far from being a "blighting incubus" the R.A.F. has been the salvation of the Aircraft Industry.]

The Department of Civil Aviation, as one has said on many occasions in this paper, has missed magnificent opportunities of developing Civil Aviation. It neglected the opportunities of spending money which was allocated to it for the development of Civil Aviation. This money should have been spent on the proper organisation of air routes and on the production of aeroplanes for commercial purposes. It failed to do so and General Sykes has nobody to thank except himself if his Department is wiped out of existence.

Those aeroplanes which have been produced and are likely to be of use in Civil Aviation have been produced to the order of the Royal Air Force. Reversing the usual order of things they are in fact commercial aircraft camouflaged as war aircraft. One may specifically mention the D.H.20, the Vickers Troop-Carrier, the Handley Page torpedo-machine with slotted wings, the Fairey Amphibian and the Short All-Metal machines. Also the Napier "Cub," the Rolls-Royce "Condor," the Bristol "Jupiter" and the new air-cooled Siddeleys, to which one may add the Sunbeam "Sikh" and the Siddeley "Tiger" as examples of big engines, have all been produced

to the order of the Royal Air Force. Neither General Sykes nor his Department have done a hand's turn towards producing better commercial aeroplanes or engines.

One has the greatest admiration for General Sykes' mental ability, foresight and determination. Personally one has a sincere regard for him and one owes at least one debt of gratitude to his personal kindness. But unhappily the failure of the Department of Civil Aviation and this last attack by General Sykes on the policy which has given us the first

Air Force in the World makes it necessary to speak perfectly plainly and say that the time has come for General Sykes to be relieved of any official responsibility for the future of British Aviation. One says it with the deepest personal regret and with a feeling that one is being ungrateful, but one's concern for the welfare of British Aviation in general and of the Royal Air Force in particular is a greater thing than one's personal feelings can possibly be.—C. G. G.]

(To be continued.)

## THE REPORT OF THE GEDDES COMMITTEE.

The much-debated Report of the Geddes Committee (consisting of Sir Eric Geddes, Lord Inchcape, Lord Faringdon, Sir Joseph Macley and Sir Guy Granet) was issued on Feb. 10th. Both time and space are lacking in which to deal with it fully, but it is necessary to record its main features.

The Report states that a reduction of £175,000,000 must be made in expenditure for 1922-23. Of this it is recommended that a reduction of £46,500,000 be made in the cost of the Fighting Services, to wit £21,000,000 in the Navy, £20,000,000 in the Army, and £5,500,000 in the Air Force.

Of the £175,000,000 to be saved, it is stated that the Government Departments themselves have proposed to economise £100,000,000. Consequently the Geddes recommendations only amount to £75,000,000. Therefore three-fifths of the total saving is to be made at the expense of the Fighting Services. Which means reducing the expenditure on those Services by about 25 per cent.

It is shown that the two Fighting Services in 1914-15 cost £20,395,000, whereas the Estimates for the three Services for 1922-23 only amount to £175,680,000. Considering the present purchasing power of the £1 sterling it would seem that three Services are now being run for the pre-war cost of two. Which would seem to indicate that the Services are much more economically run than before the war. Yet it is recommended that in spite of this roughly one-third of the cost is to be deducted. From which it would appear that the

Geddes Committee does not believe in an adequate Peace Insurance Policy.

The Committee recommends the setting up of a Ministry of Defence, with which proposal one is fully in accord, assuming that the Minister of Defence is a man whose sympathies are impartial and who is strong enough to stand against intrigue and influence from either Service, and assuming that the Under-Secretary for each Service is strong enough to hold his own against the other two.

So far as the R.A.F. is concerned, the Estimates for 1921-22 were £18,411,467. For 1922-23 they are only £12,957,300. This shows a voluntary reduction of £5,500,000. And yet the Geddes Committee recommends a further reduction of £5,500,000, in view of the fact that it has before it "the view of the Cabinet that no great war need be anticipated for at least ten years." Presumably the Committee means "need be expected," but one can hardly expect a committee of shopkeepers to know any more about their own language than they do about Imperial Defence.

As might be expected the Committee recommends a reduction in the fighting strength of the R.A.F. This reduction amounts to 8½ Squadrons, and other equally foolish reductions in other departments are recommended, while real opportunities for economy are left untouched.

One hopes to deal with the document in further detail next week.—C. G. G.

## R.A.F. INTELLIGENCE.

### R.A.F. Appointments.

Air/Commodore H. C. T. Dowling, from No. 1 Grp. H.Q. (I.A.), to H.Q. (I.A.), as Chief Staff Officer. 27/2.

Wing/Cmdr. W. L. Welsh, from No. 14 Sqdn. (M.E.A.) to R.A.F. Depot (I.A.). 17/1.

S/Ldr. T. S. Rippon, from H.Q., R.A.F., India, to H.Q. (M.E.A.). 7/1.

S/Ldr. G. S. Trevin, from No. 10 Grp. H.Q. (C.A.) to command Sea-Plane Training School (C.A.). 15/2.

S/Ldr. L. F. Forbes, from Iraq Grp. H.Q. (M.E.A.) to R.A.F. Depot (I.A.). (Superannuated.) 31/12/21.

S/Ldr. G. W. Roberts, from R.A.F. Depot, (I.A.) to No. 7 Grp. H.Q. (I.A.). 1/2.

S/Ldr. B. L. Huskisson, from Iraq Grp. H.Q. (M.E.A.) to Ammunition and Gunnery School (Cadre) (I.A.), as Chief Fighting Instructor. 15/2.

S/Ldr. J. McCrae, from R.A.F. Depot (I.A.) to No. 5 F.T.S. (I.A.). 18/2.

F/Lt. J. R. McCrindle, from British Expedition (Air Section), Paris, to Half-pay List. 25/11/21.

F/Lt. B. A. Malet, from No. 10 Grp. H.Q. (C.A.) to Sea-Plane Training School (C.A.). 15/2.

F/Lt. M. H. Butler, from No. 5 Sqdn. (India) to R.A.F. Depot (I.A.). 7/1.

F/Lt. E. Meynell, from Stores Depot, Egypt (M.E.A.) to R.A.F. Depot (I.A.). 17/1.

F/Lt. H. McW. Daniel, from Aircraft Park, India, to R.A.F. Depot (I.A.). 7/1.

F/Lt. C. H. N. Nunn, from No. 27 Sqdn. (India) to R.A.F. Depot (I.A.). 7/1.

F/Lt. C. P. O. Bartlett, from No. 39 Sqdn. (I.A.) to Half-pay List, pending embarkation overseas. 3/2.

F/Lt. C. G. Hetherington, from H.Q. 11 (Irish) Wing to School of T.T. (Men) (I.A.). 1/2.

F/Lt. J. H. Hason, from R.A.F. Airship Base (C.A.) to R.A.F. Depot (I.A.) to remain attached to School of Photography. 1/2.

### An Investiture.

H.M. the King held an Investiture at Buckingham Palace on Feb. 6th at 11.00 hours. Among those in attendance upon His Majesty was Air Marshal Sir Hugh Trenchard, Bart., Principal Air A.D.C.

The following were among those introduced into the presence of the Sovereign, when The King invested them with the Insignia of the respective Divisions of the Orders into which they have been admitted:—

The Bath:—Received Knighthood: Knight Commander.—Air/Com. Matthew Pell, R.A.F. Medical Service.

The Distinguished Service Order and Bar: Companion.—F/Lt. Roy Maxwell Drummond, R.A.F. (also received the Military Cross).

The Distinguished Service Order: Companions.—Wing/Cmdr. Louis Strange, R.A.F. (also received the Distinguished Flying Cross), F/Lt. Donald Stevenson, R.A.F. (also received the Military Cross and Bar), and F/Lt. Horace Lale, R.A.F.

### The Levée.

H.M. the King held a Levée at St. James' Palace on Feb. 8th. Group Captain H.R.H. the Duke of York was present attended by Wing/Cmdr. L. Greig. Among those in attendance upon His Majesty was Air Marshal Sir Hugh Trenchard, Principal Air A.D.C. The following officers of the R.A.F. attended the Levée:—Air Vice-Marshal Sir John M. Salmon, Wing/Cmdr. Alfred H. Wynn, F/Lts. H. H. Balfour, R. H. Sandily, F/O. H. L. Macro.

The following officers of the R.A.F. were presented to the King by the Secretary of State for Air:—F/Lt. J. C. Brooke, O/O. R. F. Cassey, F/O. H. A. Dinnage, F/Lt. V. Greenwood, F/Lt. R. Bailey, D.F.C., A.F.C., Grp/Capt. E. R. Ludlow-Hewitt, on appointment as Air A.D.C. to His Majesty, S/Ldr. W. C. Hicks, F/Lt. L. V. Hirst, F/O. R. L. Sweeney, F/Lt. A. W. Turner, F/Lt. C. Turner, F/O. A. R. Wardle.

The School of Military Administration.

The following officers of the R.A.F. have passed the Junior Officers' Course No. 2, which concluded at the School of Military Administration, Chislehead, last December.

Distinguished.—S/Ldr. G. R. M. Reid, R.A.F.

Satisfactory.—S/Ldr. R. B. Maycock, F/Lts. H. Stewart and J. T. Vernon, and F/Os. C. G. Wigglesworth, C. R. Strudwick, S. F. A. Welsh and B. E. Powell, R.A.F.



At the Croydon "Rallye"—a D.H.14 with 600 h.p. "Condor" Rolls-Royce. This machine came over from Martlesham for the "Rallye" where it was flown by Mr. Orlebar to great advantage.

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pecialmente adecuados para el  
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dant la guerre et depuis la cessa-  
tion des hostilités. Dans cette  
série de machines, le fuselage, le  
plan central et la queue, etc., sont  
de type normal, et sont construits  
de manière à pouvoir recevoir des  
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des châssis et moteurs d'autres  
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fabricados para adaptarse a di-  
ferentes tipos de alas, chasis y  
motores de otros aparatos de serie  
que sean adecuados para los fines  
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# AERONAUTICAL ENGINEERING

SUPPLEMENT TO "THE AEROPLANE"

INCORPORATING AIRCRAFT ENGINEERING, AERODYNAMICS, AIRCRAFT FINANCE AND COMMERCIAL AERONAUTICS AND MATTERS PERTAINING TO THE AERONAUTICAL ENGINEER AND THE AIRCRAFT TRADER.

## THE WEEKLY COMMENTARY.

The proceedings of the Air Conference, in so far as they touched upon technical affairs, are in part reported below. The total volume of these proceedings would suffice to fill several complete issues of this paper, and even in abstract it is impossible to report the whole in this issue.

In consequence of the space necessarily occupied by these reports it is necessary to hold over the third instalment of the series of articles entitled "The Commercial Aeroplane." When that article eventually appears it

will be found to have received an appreciable amount of confirmation at the hands of certain speakers at the Conference—notably Major F. M. Green.

The machine which has been designed by the Gloucestershire Aircraft Company for goods carrying purposes is a distinct move towards designing aircraft for special commercial purposes. The description which appears in this issue will be found to be of distinct interest.

## TECHNICAL AFFAIRS AT THE AIR CONFERENCE.

The Air Conference held at the Guildhall on Tuesday and Wednesday of last week must be regarded as a much more useful affair than one had any right to expect of it. To attempt in two days to discuss Aviation as a whole is to undertake a large risk of merely wasting time. As a matter of fact the proceedings were confined to a series of distinctly interesting papers of a highly informative nature, and to a discussion, which, with very few exceptions, was carried on by competent speakers who dealt with their subjects from a distinctly broadminded point of view and resisted the temptation to enlarge upon details.

### AN ARTIFICIAL SUBDIVISION.

The promoters of the Conference attempted to subdivide the proceedings under two heads—Commercial and Technical—a purely artificial division and one which fortunately was to a large extent unavailing. In the discussion on the "Technical" part of the programme Lt-Col. Mervyn O'Gorman voiced a thoroughly well grounded protest against the widely held theory that the administrative heads of the Royal Air Force—or, indeed, of any Military service—may safely be men of no particular knowledge of the scientific and technical qualities of the arms which they have to employ. His exposition of the danger of this theory also applied to civilian aviation, but one may suggest that he was insufficiently emphatic in this respect.

The development of air transport on any large scale as a self-supporting commercial undertaking is at the present moment purely and solely a technical affair, which can only be dealt with by technical men. Success depends solely on technical improvement both in the aeroplane itself, and in the organisation of essential auxiliaries to its economical and safe operation. In the present imperfect state of development the well-meant efforts of gentlemen who self-confessedly are entirely ignorant of technical affairs, but who see prospects either of profit or kudos as a result of premature efforts to commercialise the aeroplane, are likely to produce very serious obstacles to real progress.

It is of course highly proper that important State officials should have an opportunity of explaining the grounds whereon it is felt necessary that the Government should interfere to retard the progress of the art, but this should have been covered by a frankly political session. It is at least a matter for which one can be heartily thankful that this opportunity should have been taken and that it should have been freely admitted by the Secretary of State for Air that the official Government Department concerned can see no prospect that its efforts to encourage Civilian Aerial Transport will lead to any rapid progress during the next ten years. Which is a highly satisfactory confirmation of the opinion recently expressed in this column that official encouragement leads surely to stagnation, and that rapid progress will only result from the efforts of those who are willing to take the risk of experiment on lines other than those susceptible of official approval.

To come to the actual proceedings, the papers read were all of a very high standard. The remarks by Lord Gorell coming under the Political heading will it is believed be dealt with elsewhere—together with those more essentially political or military parts of the discussion. Colonel Bristow's paper on "Aerial Transport To-day and To-morrow," which figured in the Commercial Agenda, is on the grounds mentioned above of an almost purely technical nature. It is an exceedingly interesting paper and deals very ably with many problems which have to be solved in the near future. It is one believes unjustifiably pessimistic in its attitude towards the possibilities of great improvement in the aeroplane itself, and professes to show that the only hope for the commercial development of air transport lies in improved traffic organisation, coupled with all adequate measures for securing safety and regularity of operation. Traffic organisation is essentially a technical affair. It is certainly not an aerodynamic affair, nor is it an engineering affair; equally it is not an affair of that process of buying and selling commodities in regular demand at a certain and easily calculable profit which is now generally dignified by the name of commerce. Safety, so far as both the machine as a structure and as regards the actual operation of that machine for transport purposes, is definitely a technical affair. It is also it is true a commercial affair, but scarcely in the restricted sense to which the word is now degraded.

### A JUSTIFIED ATTITUDE.

One may suspect that Col. Bristow is thoroughly aware that radical improvements in the efficiency of the aeroplane, of a type which would profoundly modify its present commercial aspects, are neither impossible nor improbable.

But he is thoroughly justified in emphasising the very vital importance of improving the safety and reliability of the present type of machine, of organising routes, landing grounds and the like, of securing comforts and conveniences to the passengers, and in fact of taking such steps that even if the aeroplane remains for ever in its present state of inefficiency a greatly increased volume of traffic may be carried by aerial services.

For if the pessimists are correct, and no great improvement in the aeroplane as a machine is possible, it is true that in its present imperfect state it can still serve many useful purposes and it can be made to pay if traffic can be secured in sufficient volume. And if the pessimists are wrong the same attention to the requirements of safety and regularity which are vital to the mere continued existence of the present type of aeroplane will be equally vital to the full development of the commercial possibilities of the improved aeroplanes of to-morrow or the day after.

Colonel Bristow maintains that the limited volume of passenger traffic on existing air lines is due largely to the general public belief that flying is insufficiently safe, and that this condition of affairs must be remedied. Safety is to be secured by the employment of pilots of adequate skill and judgment—a condition fulfilled by the British air lines—by improving



the capacity of aeroplanes to land and pull up safely on any part of the route whereto they fly, and by perfecting aerodromes, meteorological and wireless services, and the ground organisation generally. Secondly aeroplanes must not only be safe, but the public must be convinced that they are safe. Machines often look and sound much more dangerous than they really are, and pilots by sudden and unnecessarily violent changes in the course or attitude of the machine sometimes alarm or discomfort passengers to a very serious extent.

The comfort and convenience of passengers must be given much more attention, and better facilities for the transport of personal luggage must be afforded and something is needed to alleviate the very serious inconveniences which attend an involuntary landing away from a Customs aerodrome.

The paper is full of detailed suggestions as to these apparently minor matters, which are actually of vital importance, and it is to be hoped that his paper will be given every attention by those who are engaged in practical air transport work. If the present type of "commercial" aviation—described by Col. Bristowe as "a full-scale experiment with apparatus largely of a makeshift and temporary nature"—is regarded as a piece of "*ad hoc* research" into the type of problem with which the paper deals, and is prosecuted solely in that capacity and with a proper realisation that that is its only useful purpose, it may in the end be found to have justified itself. But the cold commercial eye is likely to suffer severe frost-bite in the process.

#### PURELY TECHNICAL MATTERS

The three papers officially classed as Technical were all of very great interest. That by Major F. M. Green dealt with Research of the type likely to produce immediate and substantial results in the improvement of aircraft from the point of view of designer, constructor and user. Major Green admitted that research of this type was not necessarily fundamentally important from the scientific point of view, and made it clear that he did not favour the abandonment of more abstract research. Among the subjects which he regards as of importance, the question of settling definitely the relation between full-size results and model tests is put as the burning question of the day. Until this question is settled and decisions can be shown how to use tunnel tests on model wings and apply them without chance of serious error, it is of little use suggesting further researches on new kinds of wings.

#### FULL-SCALE TESTS.

A large amount of full-scale work has been done, but unfortunately the results cannot be as clear and definite as wind-tunnel tests. They are also expensive, but they do apply to wings on the scale used in the actual aeroplane.

Very great value will attach to tests of the resistance of real aeroplanes by the use of a thrust meter. Research work on control at low speeds is of vital importance.

The actual power expended on cooling an engine needs investigation. It is still uncertain whether the water-cooled or air-cooled engine absorbs the most power in keeping itself cool, and in regard to radiators there is much difference as to the most economical arrangement.

Such research should probably be carried out in conjunction with tests of aircrews mounted in suitable bodies.

#### MATERIALS AND STRESSES.

The properties of materials, wood and metal, of coverings, all call for investigation, as does the calculation of stresses in the aeroplane structure. The more accurately the loading in flight is known, the lighter the aeroplane structure can be made. Model tests are usually employed as a guide to the distribution of load, and therefore of stress, but it is known that the distribution of pressure is usually not quite the same in the full size. More exact knowledge of the full-size pressure distribution would allow lighter construction.

Methods of calculating stress for aircraft structures now standardised by the Air Ministry probably represent actual

facts more accurately than those used in other branches of engineering. Yet simplifying assumptions are made which are not strictly accurate, mainly because strictly accurate methods are too complex for practical use. Research on the simplification of accurate calculations particularly for redundant members is asked for.

#### ENGINE PROBLEMS.

From the engine designer's standpoint the question of materials is most important. Steels and aluminium alloys in particular have been produced with very much higher qualities than can be used in practice, because such high-grade materials are not yet made reliably by commercial methods. Research is needed, not of the kind which produces laboratory test pieces, but that which provides commercial supplies of the improved material. The problems of the actual working of materials in the workshop also afforded opportunities for research.

Many of the problems of the user of aeroplanes would be removed or made easier by the solution of the problems of the designer and constructor. Some however are apt to be lost sight of by designers and constructors. Safety against fire both in flight and in case of accident is among these. There are a number of precautions which can be taken, but further knowledge will help.

#### OPERATING PROBLEMS.

Safe landing in aerodromes will be covered to some extent by research already suggested as to control at low speeds, and a solution of this problem will probably give more advantage than the development of wings of abnormally high lift. Landings, gauges require improvement, and the design of boat hulls and floats may be bettered. These are more matters for direct experiment than particular research. Silencing of engines is fairly well understood, that of aircrews is not. Possibly it will be simplest to put passengers in sound-proof cabins.

Meteorology and navigation are further subjects of research specially interesting to the user, and wireless comes into the problem in regard to both. In regard to navigational facilities there is no reason why a pilot should not be enabled to fly blindfold, but it is essential to convince him that the gear whereto he must rely is absolutely reliable.

Wireless control of the aeroplane from the ground is not impossible, and perhaps pilots of the future may give up control at a certain distance from the landing ground and be wirelessly landed by a ground pilot. Such a method might be developed to allow safe landing at night or in dense fogs.

In concluding Major Green said that no one disputes the general value of research. The practical man is apt to be impatient with the research worker and to complain that the results submitted are not sufficiently positive to be of much value. The research worker imagines that the designer is not taking advantage of research in that he does not immediately apply the information given him. The difficulty is that the results of research are often given in a form not easily understood by the practical man, and for the sake of scientific accuracy reports are often so guarded and hedged round with conditions that the practical man will not believe them.

But real progress can only be made by acquiring a gradually more and more complete knowledge of the subject, and organised research and free discussion of results are the only methods likely to lead to this result. The high position of this country was due to the wisdom of the Government in setting up an Advisory Committee and instituting research work at the beginning of flying.

The work done by the N.P.L., the R.A.E. and the R.A.F. test stations could not be done by private enterprise, and the help so afforded was more valuable than any direct subsidy. It was hoped that even the pressing need for economy will not prevent research from being carried on in the future.

## THE GLOUCESTERSHIRE GOODS CARRIER.

There has just been designed by Mr. H. P. Folland, the chief engineer and designer of the Gloucestershire Aircraft Co. Ltd., of Cheltenham, a commercial biplane, having one or two novel features. Up to now all commercial aircraft operating on any of the recognised air lines have accommodation for passengers with a somewhat protruded space set aside for personal luggage, goods, etc. For the carriage of any quantity of goods passenger space has to be sacrificed, and, either seats removed or the goods packed as well as possible round the existing seating accommodation, involving much waste of time and valuable space. Similarly the bulk of any individual package is entirely governed by the size of the door to the cabin.

In the Gloucestershire "Goods Carrier," which has been designed primarily for the transport of goods, these difficulties are surmounted by making the fuselage of the folding type, the rear half folding round to one side, thereby allowing any merchandise to be loaded direct into the cabin, which is

large and of plain rectangular shape measuring 11 ft. 8 in. long, 5 ft. 6 in. high and 4 ft. 2 in. wide inside, giving a cubic capacity of 270 cubic feet. By this means it is possible to run goods straight into the cabin without any lifting, and, as the opening is at the end of the cabin, articles up to the full dimension of the cabin can be put in with ease. The cabin is so arranged as to be as near as possible central with the centre of gravity of the machine, so that any variation of load will have the minimum effect on the flying trim of the machine.

CONSTRUCTION.—The fuselage can be said to be of three portions, i.e. (i) the detachable engine mounting, (ii) the cabin, and (iii) the rear portion of the fuselage. The cabin is built up of spruce longons and is covered with plywood, thereby having no cross-bracing whatever. Three doors are fitted, one on one side forward, and one on each side at the rear. The front bulkhead of the cabin is covered with aluminium and asbestos sheeting, and to this the complete engine-mounting is attached. The engine mounting is built up of



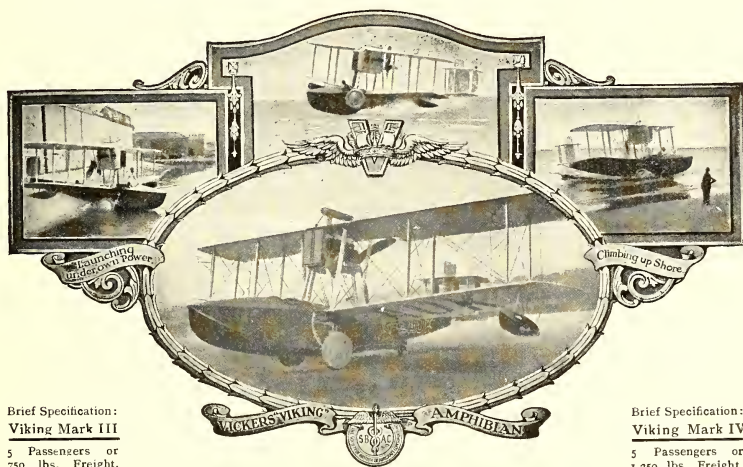
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RANGE: 480 miles.  
SPAN: 46' 0"  
HEIGHT: 15' 1"  
LENGTH: 33' 5"

The Vickers Viking was classified **FIRST** in the following competitions at the **INTERNATIONAL SEAPLANE COMPETITIONS** at **ANTWERP, July 1920**

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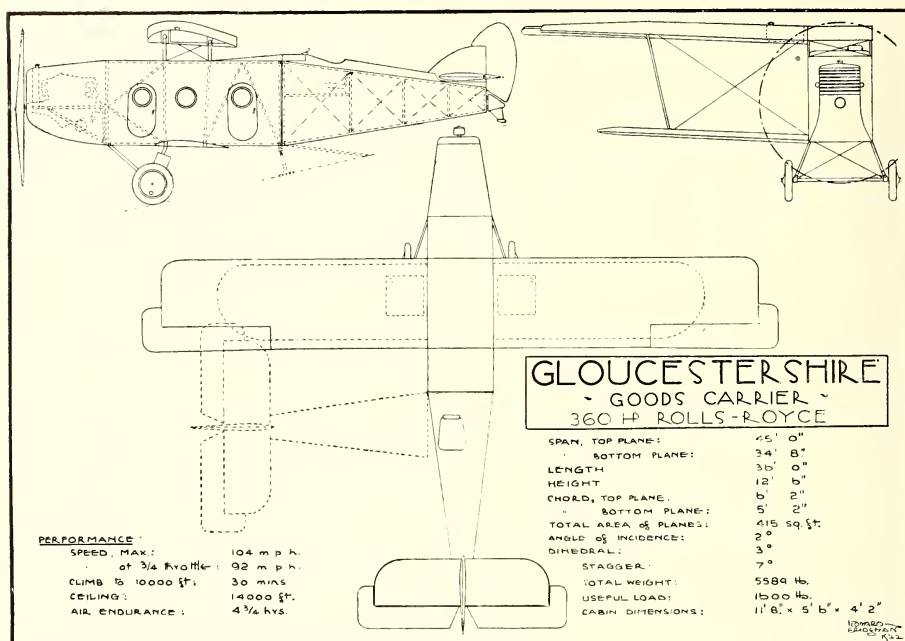
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**Viking Mark IV**

5 Passengers or  
1,250 lbs. Freight.

RANGE: 480 miles.  
SPAN: 50' 0"  
HEIGHT: 15' 1"  
LENGTH: 35' 0"

The Vickers Viking was the winner of the **FIRST** prize of £10,000 for the **Amphibian Class** of Aircraft entered for the **BRITISH AIR MINISTRY COMPETITION**, **September, 1920**

Aviation Department,  
**VICKERS HOUSE, BROADWAY, LONDON, S.W.1.**



steel tubing and has four lugs with which it can be bolted to four similar lugs on the front end of the body. The cowl is carried on a subsidiary structure attached to the engine mounting and is so fitted with substantial hinges and quick release catches as to allow for engine inspection and quick removal. The rear portion of the fuselage is constructed of steel tubes with tie-rod bracing and is fabric covered.

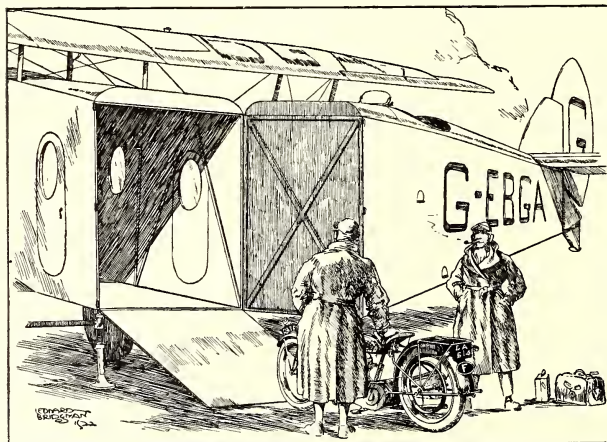
The undercarriage is built of steel tubes throughout the front legs being directly connected to the axle and cross-braced with streamline wires. The rear legs are fitted with telescopic tubes and rubber shock absorbers, together with rubber and air rebound absorbers.

The wing structure is a special arrangement of biplane having a high lift top plane and a medium lift bottom plane, the object being to utilise the advantages of the high lift wing monoplane, but without its disadvantages. With the biplane form of construction the overall dimensions with the same

landing speed are about 15 per cent. less than for a monoplane, an important consideration where housing accommodation is concerned, and at the same time the smaller dimensioned biplane is easier to handle both in the air and on the ground. Incidentally the cantilever monoplane has not the structural safety duplication as compared with the well braced biplane.

The wing structure is quite normal, consisting of ply-sided spars and spruce brace ribs. One set of interplane struts is fitted on each side braced with Raf wire. Ailerons are fitted to the top plane only. Two petrol tanks of 43 gallons capacity each are carried on the top plane, the pipe leads falling straight to a centraliser, with non-return valves for duplication safety, and thence to carburettors.

All controls are operated by joy-stick and rudder bar in the ordinary manner, with the exception that all movements are transmitted to the various control surfaces by push and pull rods, no cables or pulleys being used. All bearings subjected



#### AN AERIAL PANTECHNICON.—

The sketch gives a very excellent idea of the value of the loading and unloading arrangements of the "Gloucestershire Goods Carrier." The clear entrance to the hold given by the swinging tail arrangement and the facility with which loads may be embarked are obvious.

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## AN APPRECIATION OF THE DH9c.

The following is an extract from a letter recently received from the Compañía Española de Tráfico Aéreo—the Spanish aerial transport company which is running the Seville-Larache Air Line:—

“On the occasion of the completion of the first three months during which we have been operating the first Spanish air service between Sevilla and Larache, we should like to take the opportunity to place on record our satisfaction with the material and personnel provided by you. Using these exclusively, you will be pleased to hear that we have, since the inauguration of our service on October 15th, 1921, till January 15th, 1922, successfully completed 85 return journeys. This represents 42,500 kilometres covered without difficulty or mishap and an incalculable saving in time and increase in regularity over the existing means of transport.”

The above company is using DH9c machines exclusively supplied by :

**The De Havilland Aircraft Co., Ltd.,**  
Stag Lane Aerodrome, Edgware, Middlesex, England.

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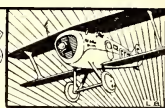
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# COMMERCIAL AERONAUTICS

## AND CIVIL AERIAL TRANSPORT.



THE UNITED KINGDOM OF GREAT BRITAIN AND IRELAND.

### CONTINENTAL ARRIVALS AND DEPARTURES.

[The following table of arrivals at and departures from the British Air Ports is compiled on the following system:—First comes the initials of the Air Line; next the type of machine; next the international number of the machine; next the ports of departure and destination; next the times of departure and arrival; next the cargo, whether goods (G) and/or mails (M); next the number of passengers; and finally the name of the pilot and number of mechanics, if any.]

ABBREVIATIONS:—A.D.—Aircraft Disposal Co. B.A.—Berkshire Aviation Co. B.C.—Bristol Aeroplane Co. B.M.—Brompton Motor Co. C.A.—Department of Civil Aviation D.H.—De Havilland Aircraft Co. G.E.—Compagnie des Grands Express Aériens H.P.—Handley Page Transport Ltd. I.L.—Instone Air Line. K.L.—Koninklijke Luchtvaart Maatschappij. L.A.—Leatherhead Aviation Services. M.A.—Messageries Aériennes. M.W.—Marconi Wireless Telegraph Co. Ltd. P.O.—Privately owned. P.L.—Peters Ltd. S.F.—Surrey Flying Services. S.N.—Syndicat National pour l'Étude des Transports Aériens (S.N.E.T.A.).

The London Terminal Aerodrome, Croydon. (Telephone: Croydon 2720.)

#### FEBRUARY 6th:

H.P., HP, G-EATH, London-Paris, 12:14-14:58, G., 3, Rogers & 1.  
I.L., DH18, G-EAWO, London-Paris, 12:35-14:45, G.M., Nil, Holmes & 1.  
M.A., Spad, F-ACMG, London-Paris, 14:25—, G., Nil, Paillet.  
G.E., Goliath, F-GEAD, Paris-London, 11:55-15:50, G., Nil, Gastoux & 1.  
I.L., DH18, G-EAWW, Paris-London, 12:10-16:55, G., 4, Courtney & 1.  
M.A., Goliath, F-ADCA, Paris-London, 13:00-16:28, G.M., 1, Challoux & 1.

#### FEBRUARY 7th:

G.E., Goliath, F-GEAO, London-Paris, 12:23-15:25, G., Chalembe & 1.  
I.L., DH18, G-FARO, London-Paris, 12:25-15:15, G.M., Nil, Robins & 1.  
A.D.C., DH9, G-EAZH, London-Paris, 12:52-15:20, Nil, Nil, Pierrey.  
A.D.C., DH9, G-EAZH, London-Paris, 12:55-15:20, Nil, Nil, Pierrey.  
H.P., DH4, G-EAWH, London-Paris, 13:00-16:15, G.M., Nil, Olley.  
G.E., Goliath, F-ADDT, Paris-London, 11:58-14:49, G., 5, Favreau & 1.  
I.L., DH18, G-EAWO, Paris-London, 12:04-14:36, G., 5, Holmes & 1.  
H.P., HP, G-EATH, Paris-London, 12:50-15:27, G.M., Nil, Rogers & 1.  
M.A., Spad, F-ACMF, Paris-London, 13:30-16:05, G.M., 3, Robyn.

#### FEBRUARY 8th:

G.E., Goliath, F-ADDT, London-Paris, 11:53—, G., 6, Gastoux & 1.  
H.P., HP, G-EATH, London-Paris, 12:20-17:05, G.M., Nil, Rogers & 1.  
I.L., DH18, G-EAWW, London-Paris, 12:52-15:55, G.M., 1, Holmes & 1.  
M.A., Spad, F-ACMF, London-Paris, 12:55-16:25, G., Nil, Robyn.  
H.P., DH4, G-EAWH, Paris-London, 11:55-13:10, Nil, Nil, Olley.  
I.L., DH18, G-EARO, Paris-London, 12:00-14:04, G., Nil, Robins & 1.  
M.A., Breguet, F-CMAJ, Paris-London, 12:50-15:27, G.M., Nil, Donclin.  
G.A., Mars II, G-EAYN, Valenciennes-Ldn—14:00, Nil, Nil, James

#### FEBRUARY 9th:

G.E., Goliath, F-ADDS, London-Paris, 11:55-16:00, G., 4, Favreau & 1.  
H.P., DH4, G-EAWH, London-Paris, 12:15-15:05, G.M., 1, Olley.  
I.L., DH18, G-EARO, London-Paris, 12:17-15:45, G.M., 5, Robins & 1.  
M.A., Goliath, F-ADCA, London-Paris, 13:10-16:50, G., 3, Challoux & 1.  
M.A., Breguet, F-CMAJ, London-Paris, 13:17-17:05, Nil, Nil, Donclin.  
H.P., HP, G-EATH, Paris-London, 11:55-13:10, G., Nil, Rogers & 1.  
G.E., Goliath, F-GEAO, Paris-London, 11:50-14:01, G., 4, Chalembe & 1.  
I.L., DH18, G-EAWW, Paris-London, 12:00-14:35, G., 2, Holmes & 1.  
M.A., Spad, F-ACMA, Paris-London, 12:45-14:55, G.M., 1, Le Men.

#### FEBRUARY 10th:

G.E., Goliath, F-GEAD, London-Paris, 11:35-14:40, G., 1, Chalembe & 1.  
H.P., HP, G-EATH, London-Paris, 12:00-15:53, G., 2, McIntosh & 1.  
I.L., DH18, G-EARO, London-Paris, 12:20-15:50, G.M., 7, Holmes & 1.  
M.A., Spad, F-ADAG, London-Paris, 12:55-15:55, G., Nil, Perignon.  
H.P., DH4, G-EAWH, Paris-London, 11:00-12:58, G., 1, Olley.  
G.E., Goliath, F-ADDS, Paris-London, 11:55-14:00, G., Nil, Favreau & 1.  
I.L., DH18, G-EAWO, Paris-London, 12:00-14:15, G., 2, Robins & 1.  
M.A., Spad, F-ACMG, Paris-London, 12:55-15:20, G.M., 3, Le Sec.

#### FEBRUARY 11th:

G.E., Goliath, F-GEAO, London-Paris, 11:35-13:55, G., 6, Favreau & 1.

### The London Terminal Aerodrome.

Monday of this week was spent in exhibition flights for the Air Conference, as reported in last week's issue, interspersed with various flights to and from the Continent by many and various French and British Companies.

Once again the Aircraft Disposal Company have held the air with D.H.9s, Bristol, and an odd Snipe. On Saturday Mr. Perry was flying the Snipe to great advantage. He brought this machine back from Lympne on Thursday because the engine was not giving full satisfaction.

The Parnall "Panther" will be erected in about a fortnight and it is expected that Mr. Muir will test the machine. It is understood that Mr. Stocken is going to do the bulk of the

M.A., Spad, F-ACMA, London-Paris, 12:52-15:05, G., Nil, Le Men.  
I.L., DH18, G-EAWW, London-Paris, 12:12-15:07, G.M., 1, Courtney & 1.  
H.P., DH4, G-EAWH, London-Paris, 12:20-15:00, G.M., 1, Wilcockson.  
M.A., Spad, F-ACMG, London-Paris, 13:12-16:50, G., 1, Le Sec.  
H.P., HP, G-EATH, Paris-London, 11:07-13:57, G., Nil, McIntosh & 1.  
G.E., Goliath, F-ADDT, Paris-London, 11:40-14:10, G., 3, Chalembe & 1.  
I.L., DH18, G-EARO, Paris-London, 12:04-14:27, G., 3, Holmes & 1.  
M.A., Spad, F-ADAE, Paris-London, 12:55-15:28, G., Nil, Paillet.  
M.A., Breguet, F-ADBO, Paris-London, 13:01-15:27, G.M., 2, Briere.  
G.E., Vimy, F-ADFR, Paris-London, 14:10-16:40, Nil, Nil, Cockerell & 1.

#### FEBRUARY 12th:

I.L., DH18, G-EAWO, London-Paris, 12:05-15:45, G., 4, Holmes & 1.  
I.L., DH18, G-EARO, London-Paris, 12:05—, G., 5, Robins & 1.  
I.L., DH18, G-EAWW, Paris-London, 11:35-13:45, G., 6, Courtney.

### Inland Flying at Croydon.

Feb. 6th—D.H.9s, Handley Pages, Snipes, S.E.5s, Martinsyde, Vimy, D.H.18s, Bristol 10-seater, D.H.11, Goliaths, Avro, Camel, Westland, various flights during exhibition preceding opening of Conference. P.L., Westland to Yeovil (R.C.P.).

Feb. 7th—M.A., Spad test (Challoux); I.L., D.H.18 test (Powell); G.E., S.E.5—M.W., Avro tests (Shaw); I.L., Vimy tests (Powell); M.A., Goliath tests (Challoux).

Feb. 9th—D.H., D.H.12 to Stag Lane (Pavne); M.W., Avro tests (Shaw); G.A.C., Mars II Sparrowhawk test (James).

Feb. 10th—H.P., H.P. test (Rogers); S.F., Avro joy-rides (Muir); G.A., Mars II to Cheltenham (James).

Feb. 11th—D.H., DH18 from Martlesham.  
Feb. 12th—S.F., Avro joy-rides (Muir).

### Flying by the Aircraft Disposal Co.

Feb. 6th—D.H.9, Mr. Pierrey, five flights; D.H.9, Major Foot, two flights; Snipe, Mr. Haynes, two flights; Martinsyde, Capt. Muir, one flight; S.E.5, Mr. Stocken, one flight.

Feb. 7th—D.H.9, Major Foot, destination Zurich; D.H.9, Mr. Pierrey, destination Zurich. Ultimately flew up to St. Moritz.

Feb. 8th—Snipe, Mr. Stocken, three flights; D.H.9, Mr. Perry, one flight (test).

Feb. 9th—D.H.9, Mr. Stocken, destination Brussels; Snipe, Mr. Perry, destination Brussels.

Feb. 10th—Bristol Fighter, Mr. Perry, one flight (test).  
Feb. 11th—Snipe, Perry, one flight (test).

### Cross-Channel Statistics.

Week ending February 12th:—  
Machines, 54; Passengers, 92; Crews, 87; Total Personnel, 179  
Corresponding week last year:—  
Machines, 22; Passengers, 25; Crews, 27; Total Personnel, 52\*

testing work of the A.D.C. and his performance on the S.E.5 on Conference Day shows that the Disposal Co. are very wise in their decision.

### THE GLOUCESTERSHIRE AIRCRAFT COMPANY.

Mr. J. H. James brought back the Gloucestershire Mars II from Valenciennes on Wednesday. He made the trip to Croydon in 1 hour 35 minutes including a landing St. Inglevert. On the following morning he intended to return to Cheltenham but as the weather to the West was very thick and as there was no special hurry to get the machine back he very wisely decided to postpone the trip to the following day. Instead, however, he took one up for a joy ride and for the space of half an hour or so he proceeded to indulge

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in some of the prettiest flying with the aid of a magnificent machine that one has yet witnessed. The Mars II appears to have no stalling point, whatever, but can apparently be slowed down at a reasonable angle of incidence to about 15 or 20 miles an hour, and when flying at this speed even on quarter throttle there is absolutely no feeling of soginess whatever.

Loops, spins, rolls, were carried out and in this flight one thoroughly realised what an absolute artist Mr. James is. All movements are carried out with absolute precision and nothing that one has ever experienced on other machines quite equals it. There are no jerky movements at all and even when carrying out "Noakes flying" there are no rough moments whatever. The Gloucestershire Aircraft Company are to be congratulated on the production of a very fine machine and it seems extraordinary that they are not at the moment receiving any encouragement from the Air Ministry.

#### GENERAL FLYING.

The same afternoon Mr. Barnard took one up for a flight in the D.H. 18 G-EARO in order to test a new type of oil which apparently gave every satisfaction.

Tests have been carried out with the Rolls-Royce engines on the "Vimy" using various types of spirit. One is told by Mr. Shaw that "Shell" spirit made the engines give fifty more "revs" than any other type.

The Bristol ten-seater has now been taken over by Handley Page Transport Ltd. The particular member of the firm who had charge of the taking over business seemed quite perturbed by the fact that there was a dent in the petrol tank about the size of a half-crown and seemed to wish to refuse the machine on those grounds. However, the machine is now taken over and will doubtless be a very great asset to the Handley Page Transport fleet. It is expected that they will take over the original Napier W.8, also ultimately three others fitted with Rolls-Royce engines.

The "Jupiter"-engined Handley Page has been doing a lot of flying during the week. The engines have encountered the natural difficulties that any new engine encounters on being installed in a type of machine which is new to it. Nevertheless the engine is, one believes, giving the utmost satisfaction and Mr. Rogers, who has been flying it during the latter part of the last week, speaks very highly of the engines. On Friday he took the machine up and stopped one engine in the air. Owing to various circumstances he was unable to start the gas starter in the air. However he landed the machine in the aerodrome with one engine with ease.

On Saturday morning a new D.H. 18 G-EAWX arrived from Stag Lane. It is, of course, fitted with a Napier Lion engine and the internal fittings are in keeping with the usual De Havilland finish.

Later on Saturday evening Mr. Hinkler arrived from Southampton on another new Avro fitted with a Siddeley "Lynx" engine. He left again on Sunday morning for an unknown destination.

Just before this Mr. Cockerell and Mr. Oliver Vickers arrived from France in the Napier Vickers "Vimy" belonging to Grands Express. The machine is going to Brooklands for examination.

On Saturday morning Mr. Courtney left Croydon for Paris on a D.H. 18 with a motor cycle and side-car as passenger. He returned on Sunday morning and encountered the usual troubles with Air-Ministry-meteorological-and-wireless-directional-incompetence. As usual he was not in the least helped to arrive at Croydon. Having gone over the clouds at Beauvais he tried hard to get in touch with ground wireless, and failed. So he stayed up above steering the sun, plus some rough aid from a compass of sorts. When he did come down through the clouds he found himself over the Crystal Palace—and so home, as Mr. Pepsy said.

Mr. Robins and Mr. Holmes took two D.H. 18s on the outward journey.

The Messageries Aériennes' "Goliath" has been performing round the aerodrome fitted with the Avelines stabiliser. This stabiliser seems to be totally unnecessary, and as it weighs about three times the weight of the average passenger and only appears to be of assistance to nonnaut pilots, one utterly fails to see the use of it. However!

Mr. W. E. Clarke of the I.A.L. was married on Saturday. He is responsible for much of the fine work done by the Napier engine on the service and everyone will wish him as much success in his married life as he has had with the engine.

Mr. Robins is being married on Feb. 28th. One hopes that this event will not draw the crowds away from a rival event on the same day.

Sir Ross and Sir Keith Smith visited the aerodrome on Friday and conferred with Mr. "Sammy" Hall on the performance of the Napier Lion under service conditions. Mr. Hall, of course, has had more experience than anybody else of this engine actually under service conditions and the Smith family would seem to have come to about the best man possible for information.—G. D.

#### The Berkshire Aviation Co., Ltd.

Latest reports from the Berkshire Aviation Co. Ltd. indicate that in spite of the intense cold they have been doing good business in the North. At Nantwich on Feb. 5th they carried 56 passengers in the day, and 516 people paid for admission to the aerodrome, which probably means a few thousand more watching the performance with "hedge tickets."

#### Donnington.

Mr. Brian Ferrand has been flying here this week and on Thursday and Friday he took up about 50 people. Owing to a mishap to the Avro she was out of commission on Saturday and Mr. O. P. Jones came up with his Avro at a moment's notice and carried a number of passengers on Sunday.

### PERSONAL NOTICES.

#### DEATHS.

COURTNEY.—On Feb. 12th, at Felixstowe, Pamela Mary, daughter of Wing/Cmdr. I. T. Courtney, R.A.F., aged three months.

JENKINS.—On Feb. 6th, at South Farnborough, owing to accident while flying, F/Lt. Robert Charles Jenkins, M.B.E., M.C., R.A.F., only surviving child of the late E. F. Jenkins and of Mrs. E. J. W. Judevine, of Hieton Croft, Godalming, aged 26.

MICHELL.—On Feb. 10th, at Burnham Beeches, as the result of a flying accident John Seymour Mitchell, civilian technical assistant, R.A.F.

PARRY and HARRIS.—On Feb. 10th, at Baldonnel Aerodrome, Co. Dublin, as the result of a flying accident, Palmer J. Parry, F/O., R.A.F., and Aircraftsman Harris.

ROBINSON.—On Feb. 10th, at Burnham Beeches, as the result of a flying accident, Geoffrey Robinson, M.C., F/O., R.A.F.

It appears from photographs of the accident that the machine was one of the D.H. 14s with the 600-h.p. "Condor" engine.

#### ENGAGEMENTS.

BURTON—FREEMAN.—The engagement is announced between F/O. Eric Burton, R.A.F., only son of Mr. and Mrs. Frank Burton, of Hildenborough, Kent, and Jessie Vivienne (Tiny), younger daughter of Mr. and Mrs. Sydney Freeman, of Waterlake, Chiddlingstone, Kent.

COX—BROWN.—A marriage has been arranged and will shortly take place between F/O. Denis A. Cox, R.A.F., seventh son of the Rev. W. E. Cox and Mrs. Cox, of Bishopsteignton, and Jane, elder daughter of the late Major John Hall Brown, of Ceylon, and Mrs. Hall Brown, of Bishopsteignton.

#### MARRIAGE

FAIRBAIRN—RIDLEY.—The marriage took place, at Christ Church, Sutton, on Feb. 6th, of Maj. Charles Osborn Fairbairn, of the A.F.C., eldest son of Mr. Charles Fairbairn, of Woolloomunda, Victoria, Australia, and Miss Irene Florence Ridley, elder daughter of Mr. and Mrs. Bishop L. Ridley, of Helwam, Canberrra, Sutton. Among those present were Sir Ross Smith, Lady Burrell, and Sir Douglas and Lady Shields.

#### BIRTHS

CORTIS-STANFORD.—On Feb. 6th, at Old Court, Hanger Hill, W.5, the wife of Wing/Cmdr. C. E. Cortis-Stanford, D.S.O., R.A.F., M.S.—a daughter.

WEBB.—On Feb. 10th, at Colne View, High Street, Watford, to Lily, the wife of F/O. H. F. Webb, R.A.F.—a son.

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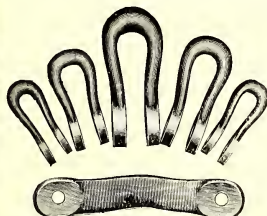
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# THE AEROPLANE

WEDNESDAY, FEB. 22, 1922.

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C. G. Grey

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SIXPENCE WEEKLY.

[Registered at the G.P.O.]  
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## THE GOSPEL IN SPAIN.



**SOWING THE GOOD SEED.**—Here are seen those two eminent apostles of aviation, Mr. Alan Cobham and Mr. Sharpe, with their D.H.9 (Siddeley "Puma" engine) in Spain. The apparent penitence of the Guardia Civile under the laying o.f. hands by Mr. Sharpe doubtless indicates his conversion, the Guardes Municipales seemingly being witnesses. Mr. Cobham, embracing an airscrew blade, seems to be regarded as an aerial saint by the juvenile populace, one of whom is seen touching him reverently.

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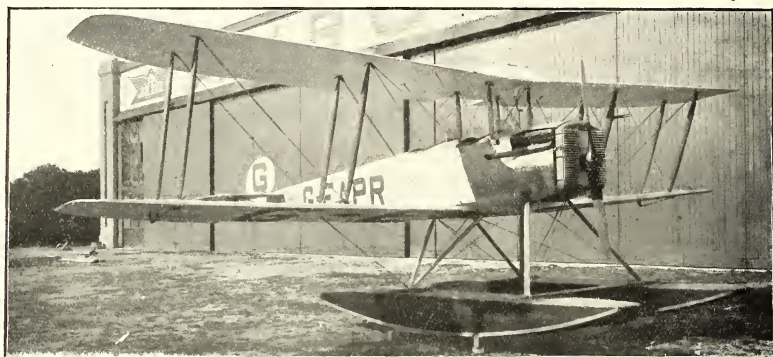
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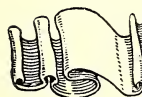
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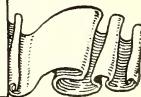
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## ON THE EQUIPMENT OF THE R.A.F.

A lamentable state of affairs concerning the equipment of the R.A.F. was disclosed on Feb. 15th in the House of Commons, thanks to Mr. Baldwin Raper. The Question and Answer were as follows:—

*Question.*

Feb. 15th, 1922.

MR. RAPER: To ask the Secretary of State for Air, if he will state what types of aeroplanes and engines are at present in use in the Royal Air Force; and how many of these types were designed before or during 1918.

*Answer for circulation in the Official Report.*

The following are the types of aeroplanes and engines at present in use in the Royal Air Force:—

### AEROPLANES.

Avro 504K  
Snipe  
Bristol Fighter  
D.H.9a  
D.H.10  
Vickers Vimy  
Vickers Vernon  
Vickers Ambulance  
F.2a Flying Boat

F.5 Flying Boat  
Faircy 3.D. Seaplane  
Westland Walrus  
Sopwith Cuckoo  
Panther  
Ships Camel  
Nieuport Nighthawk  
Sopwith Salamander

### ENGINES.

B.R.II  
B.R.I

Mono  
Napier Lion (III)

Hispano Suiza (Viper 1)  
Liberty

Rolls-Royce (Falcon 3)  
Rolls-Royce (Eagle 8)

With the exception of the "Vickers Vernon," "Vickers Ambulance," "Faircy 3.D. Seaplane" and "Westland Walrus" machines, all the above aeroplanes and engines were designed before or during 1918.

From this it appears that with the exceptions mentioned, which cannot number more than fifty machines all told, the R.A.F. is mounted on machines built during the war of war-emergency material.

Furthermore the Faircy 3D is not actually a new design, but is a modification of the excellent war-time design of that firm which has now been entirely superseded by the firm itself. Also the "Walrus" is not a new design but an unlovely modification, also superseded by the Westland firm. In fact if one regards these two as war-time designs modified, there cannot be more than a dozen post-bellum machines in use in the R.A.F.

No blame attaches to the R.A.F. Authorities, who would willingly re-equip the Air Force if they could afford to do so. The blame lies entirely with the Government which spends on doles to people who will not do an honest day's work the money which should be spent on wages to good workmen so that our aviators might be mounted on modern and reliable aeroplanes.—C. G. G.

## ON THE AIR CONFERENCE.—II.

### A British Industrial View.

[The following is a continuation of the report of the Discussion at the Air Conference on Feb. 8th. The gist of the speakers' remarks has been given and editorial comment has been interpolated in brackets wherever it has seemed appropriate.—C. G. G.]

The discussion on Feb. 8th was continued by Colonel O. B. Armstrong, President of the Federation of British Industries, who said that the Federation was convinced that air transport would be of the greatest service to industry. It was felt that the pioneers of aviation must be given support in the early stages.

[Some day one is going to write an article on pioneers, for few people seem as yet to have struck the basic truth that a pioneer is as a rule the person of all others least competent to run a commercial organisation based on the pioneer work which he himself has done.]

Col. Armstrong also remarked that it was a matter of opinion what form that support should take. [Personally one is inclined to think that a modest pension would frequently be the best support for a pioneer. It would keep him out of mischief.]

Colonel Armstrong said that research and development would proceed quicker if based on private enterprise than they would as part of a military machine. [This seems to indicate that the worthy gentleman has been primed by some of those who have already failed in Civil Aviation.]

He was at any rate sound in his remark that the routes so far tested were too short to enable full advantage to be gained from the speed of the aeroplane. Further, he said that great benefits would accrue if services were established with Egypt, India, Africa, Australia, and so on, and that it was quite possible that the saving of time as compared with ordinary methods of communication would enable profitable rates to be charged. [People who think in this way always forget that people who have been accustomed to waiting three months for letters from England, or who have been accustomed to one mail per month really do not particularly worry about quicker or more frequent communication and are not prepared to pay for it. The case of the Baghdad route is different. The excess of letters to London over those from London is due to the fact that the people who write from Baghdad are people who have only just gone out there

from home and are not a slow-witted locally-born population as in the Colonies.]

### The Star Turn.

The next speaker was Major-General Sir Sifton Branker, whose speech was quite one of the most effective contributions to the Conference. Whenever General Branker speaks in public he always talks sense and he always shows practical knowledge of his subject, which after all is only what one might expect from an officer whose experience of aviation dates from the time when as one of Sir Douglas Haig's most promising young staff officers in India he flew for miles over the Jungle on one of the primitive Bristol Box-Kites piloted by that Father of Aviation Henry Fuller, an act which showed enterprise, courage and foresight, qualities which General Branker has shown to a marked degree ever since.

General Branker referred to the pessimistic statement of Captain Guest and then proceeded to attack these supporters of the line of least resistance who said "Cut down the money spent on Military Aviation and give it to the Controller General of Civil Aviation."

He said very truly that the Military side had already been cut down to the bone. The Royal Air Force was more economically and more efficiently run than either of the two other Services. It did not waste the taxpayer's money and the Government was wise in its decision to hand over Palestine to the Air Force. There were further possibilities of economy in this way in Egypt and India. Still more money could be saved by replacing Naval establishments with Air Force establishments.

He also inadvertedly on the subtle campaign which had been going on for a year or more against the existence of the Air Ministry. He said it was instigated by the Senior Services supported by a small party in the Air Force whose motives were jealousy, self interest and stupid conservatism. As regards Lord Gerdell's paper General Branker said he seemed to be damning himself with faint praise. He (General Branker) thought the London-Paris service would pay to-morrow if the transport companies had been nursed over the past three years and if the French Government had been persuaded not to cut rates by means of an unsoundly large subsidy. He thought the London-Paris service was of little

value except that it was a stage in experimental air routes from which we could gain experience for bigger things.

He suggested that the Government should once more consider the question of a big and influential national company in which they would definitely participate and have a share of control for the purpose of developing at once those routes which were most important to the Empire.

He reiterated the statement which has been so often expressed in this paper that the Admiralty and the War Office were trying to smash the Air Ministry. He hoped earnestly that the Government would accept the Geddes Committee's recommendation to create a Ministry of Defence and so stop the harm done by jealousy. He said that the Civil and Service side of the Air Ministry were hardly on speaking terms with one another and there seemed to be no serious effort to make them co-operate.

[On the whole General Branker's speech quite made some people wish that he could be appointed Controller-General of Civil Aviation. At any rate things would be made to move if he were C.G.C.A.]

### The Post Office View.

General F. E. Williams, Assistant Secretary of the General Post Office, defended the work done by his Department. He showed that air mail agreements had been made with France, Belgium and Holland.

He pointed out that air mail work was in its infancy and that the Post Office had to take into consideration regularity, cost, the distances over which the service operated, and the possibility of night flying, before it could give full support to air mail services. It was keeping in the closest touch with every development of the air lines so as to make use of every advantage offered and it looked forward to a future when air lines would give a cheap, rapid and safe method of communication to link up not only the Empire but the whole World.

### Wit and Wisdom.

Mr. Handley Page was, as usual, witty, pointed, and sensible in his remarks. He said that he was depressed by Captain Guest's speech and disagreed entirely with him as to the future of air traffic in Europe. Travelling himself as an ordinary passenger and not as a British Minister he did not think much of the rail and boat communication with Europe. On the other hand, Captain Guest's recent experiences in travelling by air were a little unfortunate, but he must remember that he was not travelling by the normal Civil Aviation route. [The reference here of course is to Captain Guest's journey to Paris with three R.A.F. machines which experienced certain trouble on the way, with the result that Captain Guest came back by train and only one of his three machines made a successful journey home.]

Turning to the relations between makers and users Mr. Page said that constructors thought that transport companies only had to take an aeroplane from the constructor and fill it with passengers. Nothing but experience would teach them otherwise.

He regretted the belittling of foreign designs by people in this country. [Here perhaps Mr. Page is right in that knowing his own countrymen he realises that if our designers and constructors once get it into their heads that we are in front of the rest of the World they will probably sit back and display no more energy or enterprise. One must see to this matter in the THE AEROPLANE in the near future, having recently demonstrated the superiority of the British industry over its foreign competitors. In fact, if one could afford it one would produce two issues of THE AEROPLANE, one to go abroad and demonstrate the superiority of our designers and constructors over any others in the World and one for home consumption demonstrating equally forcibly the fact that our designers and constructors really know very little about their jobs and will inevitably be competed out of existence if they do not display more foresight and intelligence.]

Mr. Page said that in America the air mail service had proved a distinct boon when operated properly in conjunction with the railways. People abroad might not be developing along our lines, as for example in their ideas of wing design, but they were doing well on their own lines.

He asked what is a commercial aviation proposition? and he answered the question by saying that it consisted in delivering goods at a price that satisfied customers. Thus it was better to start with a subsidised commercial service which was able to operate at reasonable fares.

As to Imperial air routes he believed that they would be built up by a series of short lines developed commercially and that they would not be big things brought into being with money snatched from City financiers. Such a system of development would be better than opening military air routes. [Though one is very much in favour of new air routes being opened by the Royal Air Force one certainly agrees with Mr. Handley Page that the great commercial air lines will be built up from a series of short commercial lines. Nearly all our great railways and the great railways of all other countries have been built up by linking short lines and the great scheme for the amalgamation of the immense number of ex-

pensively and inefficiently run little railways in England with the big railways shows that even in such an ancient industry this same system is still progressing.]

On the subject of goods traffic Mr. Page pointed out that the foreign cross-Channel lines carried more goods because throughout the Summer the British lines were full of passengers. Matters should be still better this year because the new rates to be fixed would be only slightly above railway rates. As regards the support of aviation by the Press, he remarked that the story of "the bride in tears" appeared to be a most popular aviation item in our newspapers, so now we know what it was that really interested the public in connection with aviation.

### The Commercial View.

Sir Samuel Instone, who won his knightly spurs in the Great War and in connection with British Aviation, as was the case with our only Air-Baronet, remarked that he was shocked by what Captain Guest had said. He asked whether we had come to bury Civil Aviation or to praise it? Personally if he thought that aviation was not a commercial proposition in Europe he would not be there that day. He was pleased to see the appointment of the Advisory Committee, but he wanted to know why there was no place on it for a representative of aviation services.

He thought that the £200,000 allocated to Civil Aviation was not enough out of the £18,000,000 allotted in the Air Estimates. £100,000 out of the £200,000 was to be spent on machines this year. All honour to the Air Force, he said, but how was the other £17,80,000 spent?

He suggested that surely some of this could be spent on Civil Aviation. He imagined councils being held at the Air Ministry to find out how to spend those millions. (He pronounced the word "millions" with respectful emotion.) He suggested economising on the Coast Guard. All honour to it, he said, but he suggested that amphibian aeroplanes could do the Coast Guard's work. The expenditure of the Air Ministry should be looked into by a standing committee.

### A Little Advice.

[One recommends Sir Samuel Instone to buy a copy of last year's Air Estimates from His Majesty's Stationery Office for a few pence. He will then see precisely how the money is allocated to the various departments of the Air Ministry and how it is divided among the sub-departments. Then if Sir Samuel's imagination requires any exercise it can devote itself to wondering how on earth the Service side of the Air Ministry manages to carry on its work and to provide adequately for the aerial defence of the British Empire with the absurdly small sum which is allocated to it.]

It is possible that Sir Samuel does not quite appreciate the importance of preparedness for aerial defence. Perhaps in the sylvan quietude of his dignified up-river residence in the vicinity of Maidenhead he did not experience the full force of the German Lohb-raids on London. If he had had such experience one can scarcely imagine his grudging any of the money which is allocated to the Royal Air Force.

Sir Samuel's suggestion that amphibian aeroplanes could do the work of the Coast Guards is not without its humorous side. He, perhaps, having a bent in that direction, can imagine a Fahey or a Supermarine coming into the tiny harbour of a fishing village and tying up the boat slipway in order that its crew may examine the personnel of the local fishing fleet to see that they have not acquired smuggleable articles from French, Belgian, Dutch or German fishing boats on the high seas, thus infringing the regulations against importing any one of the two thousand or thereabouts articles whose importation is made illegal for the benefit of our unenterprising "fish" industries.

Sir Samuel undoubtedly possesses the essential money-making characteristic of imagination for if he had not he would never have made any money out of the coal trade, and would never have engaged in Civil Aviation as a path for his further advancement. But one ventures to suggest that it would certainly be to the advantage of the Instone Air Line if its chief would concentrate his imagination on imagining new and improved methods of operating air lines and would not let it wander into realms which pertain to His Majesty's Services.

At any rate, it is to his credit that he was the only person at the Conference who ventured to suggest that aeroplanes, either boat or float, might be of some practical use.]

### Terminal Propositions.

Sir Charles Bright, who was present as a representative of the Institution of Electrical Engineers, remarked that urging economy was not inconsistent with urging expenditure on proper objects. An Imperial air service to develop inter-Imperial trade was certainly needed.

Colonel Barratt-Lennard, of Handley Page Transport Ltd., also deplored Captain Guest's remarks, and said that it was regrettable that in view of Captain Guest's pessimism he had not prevented as far as he could the enormous waste of energy represented by the exhibition of practical aviation shown at Croydon on the previous Monday.



To wind up the morning session General Branker moved on behalf of Mr. Holt Thomas the following resolution:—

"That, in view of the necessity of increased rapidity of communication within the Empire, and in view of the progress made by the other nations in civil aviation, this conference calls upon the Government to give due and immediate consideration to the foundation of an air mail throughout the Empire."

This resolution was agreed without discussion.

### The After-Lunch Discussion.

On the re-opening of the session after lunch the first speaker was Captain Geoffrey de Havilland, who discussed the respective merits of metal and wood construction and seemed on the whole to favor the use of wood, at any rate for the present. His remarks will be dealt with at greater length by Captain Sayers.

Lieut.-Colonel Mervyn O'Gorman, C.B., representing the Royal Aeronautical Society, welcomed the Conference, for, as he put it, it enabled one to detect the direction of the wind. He then turned to Lord Greville's remark that it would be a disadvantage for a man in his position to have technical qualifications. Colonel O'Gorman suggested that the success of the British Services in the past was due to the fact that those in control did possess technical knowledge. For example, the old generals of the past had full technical knowledge of what could be done by a horse, a horse and cart, and a man on foot. He suggested that really technical knowledge would be of an immense advantage to any official dealing with aviation.

"Perhaps one may be permitted to point out what appears to be a fallacy in Col. O'Gorman's argument. It is quite true that the old generals of the past had intimate technical knowledge of the material which they handled, but one doubts very much whether that technical knowledge extended to the Secretary of State for War of the period. For instance, one doubts whether the Secretary of State would know precisely how many horses and carts could be put onto a mile of road or the average rate of travel of a column in full marching order, and unless the Secretary of State happened to be a hunting man he would probably know still less about technical matters affecting horses."

Similarly to-day the senior officers of the Royal Air Force have a most intimate technical knowledge of their subject. For example, nothing was more surprising during the War than the frequency with which Major-General Sir Hugh Trenchard, as he then was, fixed on certain types of aeroplanes as the most desirable for the fighting of the following few months and proved ultimately to be perfectly right although he frequently was opposed not only by technical officers but by civilian experts at home. And similarly the Air Officers of the R.A.F. to-day nearly all have very considerable technical knowledge, at any rate so far as the use and performance of aircraft are concerned.]

### Purchasers and Manufacturers.

Apart from this little point Colonel O'Gorman confessed that he felt rather like the lion in the famous picture without a Christian to devour, so he turned with his usual humour and charm to approving recent official actions and made some very valuable suggestions. He pointed out that an ignorant purchaser made a bad article, an ignorantly produced article, because the manufacturer gave him what he wanted, as for example a beautifully varnished motor-car which was badly made inside. [This is a point which might well be considered by proprietors of air lines.]

After approval of the establishment of the R.A.F. Staff College, as it would mean a greater amount of knowledge in the R.A.F. It was true that pilots were not purchasers of aeroplanes, but they influenced the type of aeroplane to be purchased. The new people coming through Cranwell might be taught to express the quality of aeroplanes not as "awfully" or "jolly" good, but as "to 10 per cent.," or something of that sort, better than others. The thing to do was to let the trade know what was wanted and to press on research. [One cordially agrees with Colonel O'Gorman's sentiments, and one believes that as a matter of fact the cadets at Cranwell do actually learn to think of their aeroplanes as a cavalry officer thinks of his horse and that they do acquire as much technical knowledge of their mounts as does a cavalryman.]

### Theory and Practice.

Professor Rainstow expressed his belief that research produces the best aeroplanes. [Here one does not quite agree, in that some of the best aeroplanes have been produced without owing anything to any research work. Also, in view of the fact that there seems to be a tendency among our high-class scientists to believe that wing forms have very little effect on the performance of aeroplanes, one is inclined to question the value of research as it is conducted at present.]

Professor Rainstow strongly advocated the suppression of watertight compartments in official circles. [On this point one agrees with him cordially. If there were more inter-

change of information and ideas between one section and another in the Air Ministry and among all technical people progress would be very much more rapid and many foolish mistakes would be avoided.]

He also suggested that an answer to a problem obtained by pure mathematical reasoning was more likely to be satisfactory than a result got by experiments, either with models or in actual machines. [Against this one may advance the well-proved theory of one of our most successful designers—that so long as an aeroplane is three weeks in front of the drawing office it has a sporting chance of being a success.]

Professor Burstall briefly advocated experiments with direct injection of heavy oil fuel in order to remove the danger of fire in aeroplanes. [This is what THE AEROPLANE has been preaching for years.]

### Bolshevistic Science.

Sir Richard Glazebrook said that the full importance of research was not realised in high quarters. Fundamental research could produce a revolution in design. *Ad hoc* and technical research merely produced a slow reformation. [The reply to this argument seems fairly obvious on the face of it. Does Doctor Glazebrook prefer Bolshevism to moderate reform in Imperial Politics? If not (as one presumes he does not) why should he favour Bolshevistic science? In any case what has Dr. Glazebrook to show for the fundamental research done at the N.P.L. or elsewhere? Did the N.P.L. produce variable camber wings or slotted wings or did it ever do anything to encourage theoretically the use of high lift wings?]

Continuing, Dr. Glazebrook referred to the need for support of fundamental research tests which were being carried on internationally in England, France, Italy and America. [One might ask in this connection why these tests which are apparently arranged between the high-class aeronautical scientists of various nations are not also being made in collaboration with Germany, where, at any rate according to one's personal beliefs, the theoreticians have very much more practical knowledge than they have in most other countries. At any rate one is of the opinion that the work done by privately owned wind-tunnels in this country and by the wind-tunnel experimenters in Germany appears to be of much higher practical value than that done by our officially supported research specialists in this country.]

The importance of research was further illustrated by Dr. Glazebrook in his statement that certain information concerning the R.38 existed before the accident which if utilised to the full would have thrown grave doubts on the safety of the ship. [In this connection one would like to know precisely why this valuable information was not communicated to the people most concerned, namely, the designers of R.38. It seems that there is something to be said for the suggestion of one ex-R.F.C. officer that there should be a conference of "little bugs" in the aircraft world as a kind of supplement to the conference of "big bugs" at the Guildhall. Judging by one's own personal knowledge of the aircraft community one is strongly of the opinion that it is these comparatively unconsidered persons who really know how things ought to be done and how things are done, especially when they are done in the wrong way.]

Further, Dr. Glazebrook lamented the discontinuation of experiments on airships which were just beginning. [Perhaps one might be permitted to ask why these experiments were not begun before the airship service was shut down.]

Mr. Alan Chorlton commented on the difficulty which the Press must have in sorting out the points which were of interest in a debate like this. [One can assure Mr. Chorlton that the lay Press at any rate has no difficulty in sorting out the points which its editors consider of the greatest interest. It only has to locate the most foolish remarks.]

### Our Practical Scientists.

Professor Melville Jones, of Cambridge, said that technical research people ought to be pilots. That at any rate would weed out some of the brain-storm people. He suggested that five or ten men a year from the Universities should be trained for a year by the Royal Air Force much as the Royal Engineers used to train University people before the War for technical military work. He besought the Air Ministry above all things not to invent a kind of guillotine process by which a junior clerk could put a blue pencil through any estimate which mentioned aeroplanes.

Mr. J. D. North, of Boulton and Paul's, said that it appeared to him that Capt. Guest's speech was an attack of Ministerial indigestion and that General Branker's was a dose of ginger. Referring to metal construction he said that already metal machines could be built as light as wood machines, and that with modern alloys and high tensile steels he believed that a 25 per cent. reduction in weight was in sight.

Mr. H. P. Folland lamented that after six years of research aeroplanes still had the same old arrangement of tail and wings. Perhaps after all Caproni with his triple triplane



was on the right track. At any rate, the money spent on helicopters would be much better spent on engines. He also suggested that there should be international rules as to the landing speeds of racing machines, as to factors of safety in commercial machines, and as to petrol systems. Under the present arrangement, thanks to our careful Air Ministry, foreigners were able to go much nearer the edge of safety than we could.

S/Ldr. Roderick Hill said that casualties in Civil Aviation were skillfully disguised officially. When he read the official reports .0005 of a corpse did not interest him. But when one came to work it out it meant that casualties on the railways at the same rate would mean about 300 people per day killed on the London Tubes. It was true that we were making some progress and we had to pay for it on the principle of "nothing for nothing and damn little for sixpence." For Commercial Aviation he wanted twin-engined machines, each engine of which would be powerful enough to carry on if the other stopped.

### Outside Critics.

Major Hely Powell, of the Royal Colonial Institute, said that he was startled at Capt Guest's proposition that we could lose our old airship personnel and start again as we did at the beginning of the last war. It was not waste of money to spend it on air work. The French did their window dressing much better. [On this point one may remark that of the cross-Channel passengers about 2 per cent. are French, about 40 per cent. are Americans, and the rest are English and assorted nationalities.]

He also suggested that we ought to use our own timber. [Here one may remark that we have got timber and would have timber to spare but for the Timber King which prevents good new timber from coming into the country in the hopes that it may be able to sell its old stock, all of which has been gone over by the officials of the Aeronautical Inspection Department dozens of times.]

Major Wilfrid Blake boldly stated that air mails were a washout. He had tried sending letters from Warsaw, from Berlin and from Paris by air and by the ordinary route, and in every case letters sent by air arrived after the train letters. It was a fallacy to think that inland air services could not be made to pay. We might try a mail service from London to Ireland as a start. He was sorry for Capt. Guest that he should think as he did.

### Useful Suggestions.

Mr. Handley Page said that the Air Ministry ought to pay more attention to competitions for efficient machines. Thus they would produce more types from which lines could take their choice. Engines ought to be tested in the air. He knew from personal experience that testing engines on the

road resulted in penalties imposed by the competent authorities as well as in breakdowns of parts. Nevertheless our engines were fairly reliable and he advocated improvements in aeroplanes rather than in engines.

General Branker insisted on his belief in the stability of aeroplanes as most important to the progress of Civil Aviation. He said that he preferred automatic stability to inherent stability, as with an automatic device the machine did not have to move far before stabilising itself. As to figures, he did not believe in S/Ldr. Roderick Hill's 300 corpses a day any more than he believed in the .00002 corpses per hour of the Controller-General of Civil Aviation.

### The Finale.

Captain Guest, in winding up the proceedings, said that he was glad that he had come up against contrary opinions. They were just what were wanted at a conference. The attendance was very satisfactory, considering the busy time of year. (Who is busy?) He was delighted at the display of life by those on whom the life of the Air Ministry depended, for the Air Ministry had recently been engaged in a life-and-death struggle, and it would still be destroyed root and branch if it did not fight.

His own statement that air services in Europe were not likely to pay was his present opinion. He would like to see its accuracy disproved. What he really meant was that the great object for which British Aviation should work was the Imperial Air Route, which would be developed when the cross-Channel services had proved a success.

The Air Ministry was trying to present the pivotal staff of the airships. Those present should call on the British Public to do more and not on the Air Ministry, which was already converted. It was far better that the public should pay voluntarily for airships than that they should be made to pay by the exaction of taxes.

Lord Grey concluded the proceedings by thanking gracefully the City of London and the Press for the support which they had given to the Conference.

And so ended the Second Air Parliament. Its effect on history may not be great. But, as Colonel O'Gorman said, it showed which way the wind blew. The general indication seemed to be that everybody is disatisfied with the present control of the Department of Civil Aviation, for nobody had a good word to say for it.

In other directions the people who seemed most dissatisfied were the high-brow scientists, who apparently find themselves neglected, for the very good reason that they contribute little or nothing to the progress of aviation, and the airship people, who are simply too expensive for our present state. Apart from that the general spirit of the Conference was distinctly encouraging.—C. G. G.

## R.A.F. INTELLIGENCE.

### R.A.F. Appointments.

S/Ldr. E. H. Sparling, A.F.C., from No. 5 F.T.S. (I.A.) to Armament and Gunnery School (Cadre) (I.A.) 18/2.  
 F/Lt. A. McRitchie Moffatt from Inspector of Recruiting (London) (C.A.) to Armament and Gunnery School (Cadre) (I.A.) 18/2.  
 F/Lt. S. M. Kinkaid, D.S.O., D.S.C., D.F.C., from No. 24 Sqn. (I.A.) to No. 30 Sqn. (Iraq Group) 31/1.  
 F/Lt. C. G. Hetherington, M.B.E., from H.Q. No. 11 (Irish) Wing to School of Photography 1/2. (The notice appointing this officer to school of T.T. (A.C.) with effect from 1/2 is cancelled.)  
 F/Lt. C. J. W. Darwin, D.S.O., from R.A.F. Cadet College (Ground Wing), Cranwell, to H.Q. R.A.F. Cranwell 1/2.  
 F/Lt. W. R. Farrington, D.S.O., from Boys' Wing, Cranwell, to H.Q. R.A.F. Cranwell 1/2.  
 F/Lt. A. L. Messenger, A.F.C., from No. 3 F.T.S. (I.A.) to Half-pay List, pending embarkation overseas 11/2.  
 F/Lt. I. Culver, A.F.C., from No. 5 F.T.S. (I.A.) to Armament and Gunnery School (Cadre) (I.A.) 1/3.  
 F/Lt. D. H. W. Williamson, from R.A.F. Depot (I.A.) to Electrical and Wireless School (I.A.) 2/2.  
 F/Lt. E. Drudge, M.B.E., from Half-pay List to H.Q. Iraq Group 4/2.  
 F/Lt. H. E. F. Wynne, O.B.E., M.C., from No. 7 Grp. H.Q. (I.A.) to R.A.F. School (India) 2/2.  
 F/Lt. H. V. German from Half-pay List to H.Q. Iraq Group, for duty at R.A.F. Prison (on formation) 2/2.  
 F/Lt. R. E. Nicholl from C.F.S. to H.Q. Iraq Group 2/2.  
 F/Lt. P. St. John Woodard, A.F.C., from No. 5 F.T.S. (I.A.) to No. 4 F.T.S. (M.E.A.) 3/2.  
 F/Lt. A. H. Pearce, D.F.C., from H.Q. R.A.F. (India) to Iraq Group H.Q. (M.E.A.) 12/1.  
 F/Lt. W. S. Magrath from No. 84 Sqn. (M.E.A.) to No. 14 Sqn. (M.E.A.) 30/11/21.  
 F/Lt. H. R. A. Cochrane, A.F.C., from H.Q. (M.E.A.) to No. 45 Sqn. (M.E.A.) 7/1.  
 F/Lt. W. H. Dunn, from No. 5 Sqn. (India) to R.A.F. School (India) 14/12/21.  
 F/Lt. E. A. Fawcett from R.A.F. Depot (I.A.) to No. 1 School of T.T. (Boys) (Haltom) 13/2.  
 F/Lt. G. D. Nelson, D.S.C., A.F.C., from No. 1 School of T.T. (Boys) (Haltom) to Air Staffery (Directorate of Training and Organisation) 1/2.  
 F/Lt. E. J. Cooper, D.S.C., from School of Naval Co-operation and Aerial Navigation (C.A.) to No. 230 Sqn. (C.A.) 8/2.  
 F/Lt. R. W. C. West from No. 1 Sqn. (M.E.A.) to Armament and Gunnery School (I.A.) 24/12/21.  
 F/Lt. O. A. Armer, from Electrical and Wireless School (I.A.) to R.A.F. Depot (I.A.) 7/2.

F/Lt. A. Fitz-Roy Semerslet-Copley, from Iraq Grp. H.Q. (M.E.A.) to Aircraft Park, Iraq (M.E.A.) 23/12/21.  
 F/Lt. C. E. W. Lockyer, from No. 208 Sqn. (M.E.A.) to R.A.F. Depot (I.A.) 25/1.

Grp./Capt. E. L. Gerrard, C.M.G., D.S.O., from R.A.F. Depot (I.A.), to command No. 1 Grp. H.Q. (I.A.), vice Air Commodore H. C. T. Dowling, C.M.G., 27/2.  
 F/Lt. G. St. Leger Campion, from No. 100 Sqn. No. 11 (Irish) Wing to No. 2 Sqn. No. 11 (Irish) Wing 8/2.

F/Lt. W. A. Malone, from School of Army Co-operation (I.A.), to R.A.F. Depot (I.A.) 20/11/21.  
 F/Lt. G. Pilkington, A.F.C., from R.A.F. Depot (I.A.) to No. 4 Sqn. (I.A.) 18/2.

F/Lt. B. J. Silly, M.C., D.F.C., from C.F.S. (I.A.) to No. 5 F.T.S. (I.A.) 15/2.

F/Lt. H. L. Nunn, D.S.C., D.F.C., from No. 230 Sqn. (C.A.), to School of Naval Co-operation and Aerial Navigation (C.A.) 21/2.  
 F/Lt. E. A. E. Wood from Air Ministry (Director-General of Supply and Research) to R.A.F. Depot (I.A.) (supernumerary) 3/2.

F/Lt. A. R. Churchman, D.F.C., from R.A.F. Depot (I.A.) to H.Q. (I.A.) 13/2.

F/Lt. A. R. Arnold, D.F.C., A.F.C., from R.A.F. Depot (I.A.), to R.A.F. Cadet College (Flying Wing) (Cranwell) 15/2.

From the *London Gazette*, Feb. 17th.—R.A.F.—General Duties Branch.

Capt. P. R. C. Groves, C.B., C.M.G., is placed on the retired list, and is granted the hon. rank of Brig.-Gen. (Feb. 1921).

Air Vice-Marshal Sir E. L. Ellington, K.C.B., C.M.G., C.B.E., from Air Ministry, to Middle East Area, on termination of appointment as Director-General of Supply and Research 31/2.

Air Vice-Marshal Sir W. G. H. Salmond, K.C.M.G., C.B., D.S.O., from Middle East Area to Air Ministry, on appointment as Director-General of Supply and Research 27/2.

### A Levee.

H.M. the King held a Levee at St. James's Palace on Feb. 14th. Group Captain H.R.H. the Duke of York, K.G., G.C.V.O., was present.

Among those in attendance upon His Majesty was Air Marshal Sir H. M. Trenchard, Bart., K.C.B., D.S.O., A.D.C. The Secretary of State for Air attended the Levee and presented the following officers of the R.A.F.:

S/Ldr. J. T. Babington, D.S.O., F/Lt. T. G. Bowler, F/Lt.

(Continued on page 143.)

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ant construit jusqu'à ce jour.Etude et entreprise de la four-  
niture du matériel complet pour  
services de transport aérien rapide  
de passagers, postes et mar-  
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Gouvernement Britannique pen-  
dant la guerre et depuis la cessa-  
tion des hostilités. Dans cette  
série de machines, le fuselage, le  
plan central et la queue, etc., sont  
de type normal, et sont construits  
de manière à pouvoir recevoir des  
ailes de types différents, ainsi que  
des châssis et moteurs d'autres  
machines de la série, de manière  
à être appropriés à l'usage auquel  
la machine est destinée dans  
chaque cas particulier. Toutes les  
machines de cette série ont des  
ailes démontables et repliables et  
sont munies de notre dispositif  
breveté de cambrure variable, qui  
permet les plus grandes per-  
formances et qui combine une grande  
puissance de soulèvement avec une  
faible vitesse d'atterrissage.Proveedores del Almirantazgo,  
Departamento de Guerra y  
Ministerio de Aviación Británicos.  
Únicos poseedores de la patente Fairey  
de dispositivos de coneco variable para  
aeroplanos, hidroaviones y barcos aéreos.Diseñadores y constructores de  
hidroaviones, barcos aéreos, aéro-  
planos, aparatos anfíbios, de todas  
clases, también de aparatos es-  
pecialmente adecuados para el  
levantamiento de cartas topográ-  
ficas y fotografías, hangares flo-  
tantes y completo equipo para  
estos mismos.Diseñadores, por orden especial  
del Gobierno Británico del barco  
aéreo más grande que se ha cons-  
truido para este gobierno.Proveedores de todo lo necesario  
para servicios de transporte aéreo  
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de su terminación. En esta  
serie de aparatos, el fuselage,  
el plano central y la unidad  
de la cola, son de tipo normal y  
fabricados para adaptarse a di-  
ferentes tipos de alas, chassis y  
motores de otros aparatos de serie  
que sean adecuados para los fines  
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# AERONAUTICAL ENGINEERING

## SUPPLEMENT TO "THE AEROPLANE"

INCORPORATING AIRCRAFT ENGINEERING, AERODYNAMICS, AIRCRAFT FINANCE AND COMMERCIAL AERONAUTICS AND MATTERS PERTAINING TO THE AERONAUTICAL ENGINEER AND THE AIRCRAFT TRADER.

### THE WEEKLY COMMENTARY.

The account of the Technical matters discussed at the recent Air Conference is continued below. The paper by Brig.-General Bagnall-Wild which reviews the work of the Department of Research gives a hint of the difficulties encountered in the attempt by one and the same Department to control both Research work properly so called, and practical experimental development of specific appliances.

The third instalment of the Articles on the Commercial Aeroplane deals with the same subject and points out how so-called Research hampered by the necessity for providing immediate useful results has led to a stagnation in aircraft design. It should be noted that this article

was written and in type some weeks before the opening of the Conference.

On page 140 will be found an announcement by the Institution of Aeronautical Engineers of the reciprocal arrangements which have been made with the Students Section of the Royal Aeronautical Society. These should add appreciably to the usefulness of both bodies.

The same announcement also draws attention to the forthcoming meeting whereat the President, Lieut.-Col. J. T. P. Moore-Brabazon, will lecture on the "Early Days of Aviation."

### TECHNICAL AFFAIRS AT THE AIR CONFERENCE—II.

Brigadier-General Bagnall-Wild's paper on "The Progress of Research" dealt with the work of the Department over which he now presides. It pointed out that the Directorate of Research is an engineering as well as a scientific organisation and that probably four-fifths of its work relates to experiment with specific appliances, the development of such appliances along useful channels and the test of approved air service material. The remaining fifth is Research pure and applied.

To preserve the right relationship between the two divisions and to see that the right men are employed for them was, in the speaker's opinion, the most important part of the Director's duty.

There is a tendency for experiment which promises quick results to squeeze out more lengthy investigation, even when the latter are of more fundamental importance.

University experience taught that research work required a much larger amount of personal freedom in work than had previously been the rule in Government organisations, and it was naturally difficult to adapt Government machinery to the conditions. In some cases of applied research very much the same liberty on the part of the worker was needed as in pure research, but the larger and simpler part of the work of the department was the design, development and production of apparatus or methods shown by research to be useful for some definite air purpose.

The biggest technical problem affecting Civil Aviation was the perfecting of the aero engine; the other problems turn on the fundamental one of engine performance.

For Service Aviation an important feature is the relation of Aviation to Sea Power. If, as appears possible from certain American tests, the defence of our shores can be entrusted to aircraft an immense impetus will be given to aviation and the scientific studies on which development depends.

#### ENGINE RESEARCH.

The end of engine research is the production of an engine as free from breakdown as the average motor vehicle engine. The engine on a car runs on an average at about one-third full power, whereas until lately aero engines had to average 80 to 100 per cent. of full power, and it was only recently that on modern machines it was possible to cruise at about 60 per cent. of full power. This is the fundamental difficulty increased greatly by the need for minimum weight per h.p.

Whether in addition to securing the necessary freedom from sporadic breakdown it was also possible to reduce materially the fuel consumption remains to be seen. It was unlikely that the internal combustion turbine would prove a satisfactory prime mover, for in addition to the problem of materials to withstand the high working temperature only low thermal efficiency was even theoretically possible. The steam turbine promised better than the internal combustion

type, but it was doubtful if it would in the end be better than the reciprocating internal combustion engine.

The work of Tizard and Pye, with that of the Ricardo laboratory, showed that the supposedly magic qualities of specific fuel mixtures were a myth. The only advantage of specific fuels lay in the possibility of using high compression without detonation, and so obtaining high fuel economy.

Experiments were being made to determine whether direct fuel injection was better than the carburettor system. Dr. Ferranti was working on a two-stroke engine, and the R.A.E., with Dr. Hawke's assistance, were trying to inject shale oil and work on the Diesel cycle.

A single aero engine cylinder unit was being used and it was hoped to run up to 1,000 r.p.m. The R.A.E. was also trying solid injection of a fuel consisting of 95 per cent. alcohol. The advantages of direct injection would be, high shaft point fuel with reduced fire risk, cheaper fuel, higher compression and efficiency, fuel supply independent of small pressure heads and not liable to upset from the presence of small particle of dirt, and the elimination of the magnetos.

Also as only air is compressed an economical two-stroke engine becomes possible, with a more even torque and probably a less weight per h.p. And by using an air compressor of greater capacity than necessary for normal work a supercharged engine would become a straightforward development.

Work in the East emphasised the necessity for economising water under tropical conditions. If water cooling can be dispensed with a great step forward will be made. I am brought to have I believed this possible, and now we have the Bristol "Jupiter," and the Siddeley "Jaguar." In certain tests a single air-cooled cylinder has given as much as 222 b.h.p. Enthusiasts, and he was one, believed that 1,000 h.p. air-cooled engines should be possible, and that with one or other type of cooling 2,400 h.p. at 750 r.p.m. could be reached.

A point in favour of the large single engine unit often forgotten when the division of power-plant into small units is discussed is the large mass of accessories in the multi-engine type. Apart from the engine itself and the fuel tanks, accessories for multi-engined plants averaged 1.3 lb. per h.p. against 1.0 lb. for single engines. For air cooling the single engine accessories would be near 0.4 lb. per h.p. The passage dealing with engine research concluded with a tribute to the very fine qualities of the late Major Norman, and of the great value of his services to this branch of research.

#### NAVIGATION

The most difficult problem connected with navigation was that of enabling the pilot to locate and land in the aerodrome in fog. Professor Jones had given many reasons why it was better to fly over than under clouds, but pilots would not do it till they were certain that this problem had been solved.

For thin fogs or ordinary mists bright red flares now being tried might suffice. In heavy fogs there is the possibility,

with proper ground organisation, of detecting the aeroplane by sound from the ground and signalling to it when and in what direction to glide down. This has been done at Croydon. The necessary instruments to allow of flight through clouds had been developed, and also those for navigation above clouds or over sea by astronomical methods, and the development of directional wireless was progressing.

#### MACHINES.

Work on stability continued and it was hoped in the future to give more time to the study of the subject. Great public interest had been roused in the Handley Page wing and a monoplane with a single slot is now waiting test at Farnborough. Two other Handley Page designs were in hand. Earlier trials show very remarkable results; a D.H.9 with the Handley Page wing was more efficient and had a greater climbing capacity than when fitted with the standard wing. The climbing slope was 1 in 7.2 against 1 in 10.4—a very important matter when clearing obstacles round the aerodrome. The launching run with the Handley Page wing was half that of the ordinary wing.

The "Alula" wing had also attracted attention. Model tests had not so far shown any exceptional advantage, but the possibility of large correction for full-scale conditions were being explored.

All-metal aircrews were essential for Service machines in the East. For sizes over 450 h.p. it is hoped that the increase in weight will not exceed 10 per cent.

Supercharging of engines was now shown to be possible, and to take full advantage thereof variable pitch aircrews were needed. Work is in hand at Farnborough on this subject.

Flying off and landing on the decks of ships is now becoming increasingly necessary, and proved to be possible. It was hoped in the future that amphibians as well as land machines will be easily capable of this performance. Descent on water cannot always be avoided and "landings" of this type with land machines are expensive.

Tests are being made of the sea-keeping qualities of the N.4 flying-boats. These weigh 30,000 lbs., and launching or landing them is a large task. They must therefore be made to stand long mooring out.

As to helicopters, he did not know what to say. Public money was being spent and it was hoped that they would be rewarded. The Brennan Helicopter had lifted pilot and 250 lbs. of useful load vertically—an encouraging preliminary test.

The tank tests at Farnborough had had some public attention. The difficulties of tank construction had been shown during the war, and something very close to a solution of the bullet-proof tank had been produced by Mr. Imbert. It was not entirely satisfactory in a crash.

#### MATERIALS.

Research by the Materials Sub-Committee was of great importance not only for aircraft but for general engineering purposes. In aircraft weight limits enforced working to finer

limits than the usual "factors of safety" of standard practice, and made it necessary to scrutinise the logical basis of design. This showed the need of considering fatigue limits rather than ultimate stress limits.

Work on this and allied subjects was being carried out at various universities as well as by the official bodies. The most troublesome material now used on aircraft was Petrol-Resisting Rubber. Farnborough had developed an all-metal pipe joint, and the Blaisdell "Petrol-Flex" seemed good.

The supply of suitable timber had been a difficulty, as owing to the world demand for timber of all grades the markets were not very ready to grade and sort timber to the standard needed. However, Canada was now supplying spruce so carefully graded that over 80 per cent. passed as Grade A for aircraft purposes.

#### AIRSHIPS.

The final paper, that by Major Scott on "Airships," was a strong plea for the development of the airship for commercial purposes. It pointed out that the airship had been developed under war conditions to a state in which it could serve useful commercial ends. It was hampered during the War by its dependence on shed bases and large handling parties, and the mooring mast, which removed this disability, was not developed till too late to demonstrate its use to the world at large during the war.

Thanks to that development, airships embodying no untied features could operate on long-distance routes probably all over the world, and serve as the main links in a chain of Empire-wide express communications. Such a scheme would give the commercial aeroplane the opportunity to develop for short distance feeder routes to the main line, and provide a fresh incentive to the development of air services of all types.

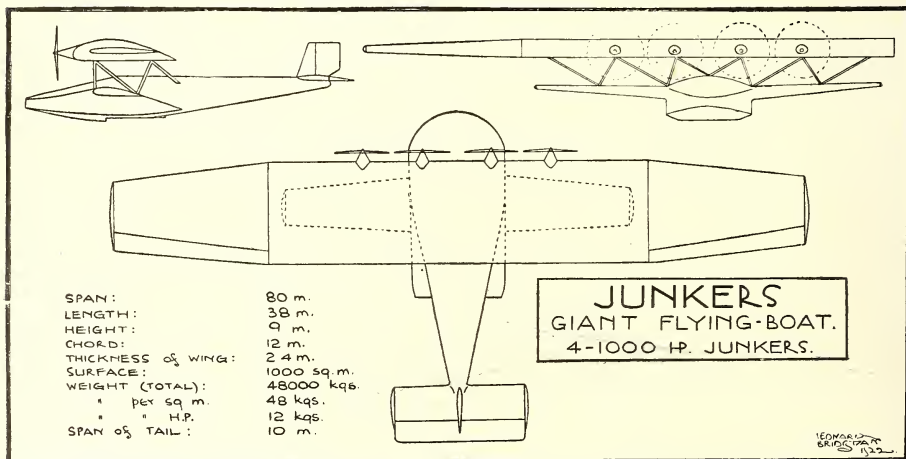
Quite apart from purely commercial or civil aspects was the defence one. Given an Imperial communication scheme in working order Service airships would become mobile, inasmuch as there would be ready prepared bases for their use all over the world, and for the defence of our trade routes airships might be of inestimable value.

The known intentions of other nations rendered it practically certain that if we abandoned our present airships we should have to start afresh in probably two years' time—and to scrap our present ships meant scrapping our chances of keeping our position among the leaders of airship development.

The paper dealt with the present capabilities of the airship on lines precisely similar to those of the same author's recent paper before the Royal Aeronautical Society, and indicated the value of such craft for speeding up Imperial communications to an extent impracticable by any other means.

If this paper is dismissed in such brief terms here it is not on account of any failure to recognise the importance of the subject, but because limitations of available space render it impossible to reproduce once more arguments which have only very recently been reported in these pages.

### A FIFTY-TON FLYING BOAT.



The outline drawing reproduced above represents a very ambitious design prepared by the Junkers Werke Dessau. The machine is to be of all-metal construction, and it is designed for four of the Junkers two-stroke opposed cylinder

engines with fuel injection. An experimental engine of this type was described in this paper in 1920, and apparently the designer is satisfied that the type can be successfully developed for large power units.



# Famous Pilots and the NAPIER 450 H.P. AERO ENGINE

Capt. Hill's aviation experience extends over a considerable period. As early as 1911 he was designing and building gliders. After some experience in the works of the Royal Aircraft Factory and the Aerodynamic Investigation Department of the R. & F. Capt. Hill served with distinction overseas with a Scout Squadron, and was awarded the M.C.

On leaving the Air Force, Capt. Hill joined Messrs. Handley Page as Chief Experimental Engineer. His experience with the Napier engine dates from its first appearance in 1917, at Farnborough, when he took the Napier on its first trial flight. In the Air Ministry Competitions he was one of the pilots who successfully gained for the Handley Page W.8 machine the highest prize in the large aeroplane class.

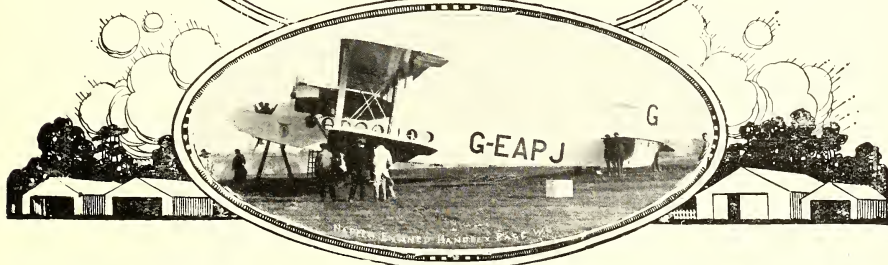
## CAPT. G. T. R. HILL, M.C., B.Sc.

As to the behaviour of the Napier engine, I sat behind it on its first trip into the air at Farnborough in 1917, when installed in a D.H.9. I have since sat behind it on many other occasions. I have sat between two "Lions" on the Handley Page V/1500, and I have never been let down. My experience sounds like that of Daniel and it is written that afterwards "no manner of hurt was found on him." This would be a very mild way of recording the results of my flights with the "Lion" engine; I would rather say that I think it is the Aero Engine of to-day.

Yours truly,

*Geoffrey Hill*

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## THE COMMERCIAL AEROPLANE.

By W. H. SAYERS.

## III. The Arrest of Aerodynamic Development.

The aeroplane as we know it to-day is the hybrid product of two utterly different and independent methods of development. From 1908 to 1914 aeroplane evolution was the result almost entirely of individual adventure.

There were no wind-tunnel results worth mentioning, the mathematical theory of stability was the neglected offspring of a brilliant mathematician having no apparent connection with facts, and the engineering world regarded the aeroplane as a mechanical curiosity whereon one might excusably expend some interest but certainly no cash.

Individual designers worked, as artists work, by a sort of inspiration as to what an aeroplane ought to be like, and built as nearly to their inspiration as the limited means, appliances and engineering knowledge they possessed would allow them. Aeroplanes of all sorts of sizes and shapes and constructions were produced, or partly produced, and although many of these productions were useless as aeroplanes, progress in aerodynamic design was, on the whole, extremely rapid. This was because the variations in type of individual aircraft tried out in that period were of a fundamental nature, affecting the whole form and aspect of the machine.

## THE BEGINNING OF CONTROL.

In 1912 or thereabouts the military authorities of most of the Great Powers by some unparalleled mischance became aware that aircraft, even in their then state, could be used for military purposes. Forthwith all Governments, in some degree or another, began experimental work. The first object of the inauguration of official research laboratories, wind tunnels, trials for military aircraft and the like, all intended for the more rapid development of aviation.

A number of scientists, mostly young—if not in years at least in engineering experience—flocked to the research laboratories, where they found that accurate measurements of the aerodynamic forces on bodies of all shapes could be made by the use of the wind tunnels with fatal facility. They further found that it so happened that using the results of these tests it was possible to predict with fair accuracy the performance of a number of existing types of machines. It is fairly obvious now that their assumption as to the correctness of their predictions were largely vitiated by the fact that the accuracy with which it was then possible to measure performances of the full-size machine was very small.

## THE EFFECT OF THE WAR.

Now it happened that in 1914 the activities of the laboratory experimentalists were fairly well under way, and had produced quite an appreciable amount of useful information, that the tractor type of biplane had shown in practice that it possessed definite advantages over all other existing types, and that the War broke out and brought with it the imperative necessity for the production of practicable aeroplanes in ever-increasing numbers.

Under this concatenation of circumstances the resulting effects were almost inevitable. The best existing type of aeroplane became standardised in general form and arrangement.

The laboratory worker, who naturally began his experiments with simple bodies, continued to experiment with simple bodies, such simple bodies as might be used as components of the standard type of aeroplane. He tested isolated wing sections, and having found a wing by itself better than any other previously tested was gratified to find that it was, usually, better when applied to an aeroplane in place of the previous wing. In fact he devoted all his attention to the improvement of the details of the standard type of aeroplane, and, because it was found in the majority of cases that improvements in components tested separately remained improvements when the component was applied to the complete aeroplane he became satisfied with his experimental methods.

Also, because he failed to make any comparison of detail with any other success, and because standard type aeroplanes did happen to conform fairly closely to his predictions of performance, he has come generally to regard the existing type of aircraft as incapable of improvement in any other manner than that of detail refinement.

Aeroplane designers themselves have largely travelled the same path. They have found in practice that keeping fairly closely to the standard shape of an aeroplane, and using—with a little discretion—the results of detail test supplied by the laboratory, they can predict the performance of an aeroplane with reasonable accuracy. The majority of designers for their bread and butter, and neither their employers nor their customers can be persuaded to take risks if and when they can see a reasonably safe and certain path to producing the desired machine.

If the contentions of the laboratory expert were correct, if it were reasonably certain that the best aeroplane is the result of combining the best wing section with the body and undercarriage of the least resistance—the items being tested separately—it is possible that no very great harm would have been done. But it is known certainly that this is not a fact.

## INTERFERENCE.

The phenomena loosely but conveniently lumped together under the head of "interference" are generally regarded as of little importance. Actually there is no certain ground for treating them with such contempt. Large numbers of experiments all tend to show that it is precisely those bodies which have extremely low resistances which behave most erratically when the flow past them is subjected to small disturbances.

Is it not possible that the standard type of aeroplane, regarded as one body is a body of such high resistance that no amount of added disturbance to the flow round it can make it very much worse? Is it not possible that it is merely the fact that all full-sized aeroplanes are so nearly the same shape that gives to wind-tunnel tests their appearance of concordance with full-size results?

## WHEN TWO AND TWO DO NOT MAKE FOUR.

It is perfectly certain if one takes an aeroplane body whose resistance at  $N$  miles per hour is  $A$  lbs., and adds to it an undercarriage which by itself at the same speed has a resistance of  $B$  lbs., that one cannot safely expect the resistance of the two together at  $N$  miles per hour to be precisely  $A+B$  lbs. That with certain very nearly uniform shapes and arrangements of these two components the resistance is usually fairly close to  $A+B$  is certainly no proof that the same conditions will hold with any change in form or arrangement.

Yet the whole basis of modern aeroplane design is the assumption that the sum of the resistance of two bodies taken separately is to all practical intents the resistance of the two taken together. It is true that cases where this has been shown to be seriously untrue are so well known that most recognised authorities insist on the importance of testing complete models of new aeroplanes.

Yet these same authorities will use the sum of the component resistances of a proposed new type to determine whether or not the type is worth testing as a complete model. This may be a reasonable method applied to the standard type. It is not a reasonable method applied to any design which involves radical change in general form.

For instance, speaking of the limited experience of the design of the open tail boom type of pusher biplane, the method of summing the resistance of component parts together with such corrections for the influence of slipstream, the influence of body on airscrew, etc., as present data allow, does not account for the very appreciable inferiority of this type as compared to the tractor biplane type.

Nor does it account for the increase in total resistance of nearly 80 per cent. made by the addition of a small tail plane to an otherwise complete model which appears to have occurred in a recent private model test. There are possibilities of error in this particular case, but it is not an isolated one.

Nobody will suggest that the resistance of a sphere is the sum of the resistance of two hemispheres, or that one can predict the resistance of a complete streamline body by testing the nose portion and the tail portion separately. And in so far as relatively simple bodies such as these two are concerned it is known fairly definitely that the resistance of the complete body is more and more different from the sum of the resistance of the parts into which it can be cut up, as the intrinsic resistance of the complete body is less and less.

It may therefore reasonably be contended that the fact that in general it appears to be fairly safe to estimate the resistance of a complete normal aeroplane by summing up the resistances of wings, bodies, struts, wires and undercarriage components treated as separate items is to be regarded only as evidence that the complete aeroplane is a body whose component parts are naturally so badly suited one to another, that each does develop its own full resistance, and does not form a whole round which a steady and single air-flow system can develop.

## THE ROYAL AERONAUTICAL SOCIETY AND RESEARCH.

A deputation representing the Royal Aeronautical Society, consisting of Lt.-Col. M. O'Gorman, C.B. (Chairman), Prof. L. Baird, C.B.E., F.R.S., Sir Mackenzie Chalmers, K.C.B., C.S.I., Prof. B. McVill Jones, A.F.C., and Lt.-Col. Alec Ogilby, C.B.E., were recently received by the Secretary of State for Air.

Their purpose was to lay before the Air Ministry the importance of providing for the continuance of Scientific Research in Aeronautics; the danger that, owing to the grouping of Research work under the same Department and vote as specific experimentation into particular appliances, and the present urgent need for economy, Research might be suppressed in favour of such specific experimentation; and to urge that an organisation be set up for the sole purpose of Research.

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## ON TEACHING FLYING.

The paper read by Squadron Leader C. F. A. Portal, D.S.O., M.C., before the Royal Aeronautical Society, on Thursday, Feb. 16th, dealt with the standard methods of training pilots now used by the R.A.F. It contained a very brief reference to the earlier methods: that of turning the pupil loose after verbal instruction, first on a machine capable only of taxiing, later on one capable of flight, and letting him find out for himself, and the early elementary dual control system.

The modern method, introduced towards the end of 1916 and still the standard, consists in the use of complete dual control plus proper telephonic communication between pilot and pupil. The pupil after a course of theoretical instruction on the ground is taken into the air, given a practical demonstration of the effects of various control movements, and is then made to take control himself, the pilot interfering physically only to avert crashes, and telling the pupil by the telephone of each error as it is made and how to correct it. The process is divided up into stages, the first being that of flying straight and level, then how to make 45 deg. turns, proceeding on to steep turns, loops, half-rolls and spins. Thereafter taking off and landing are taught. All this occurs before the pilot makes any flight by himself.

Thus no pupil takes the air by himself until he has quite a large experience of actual flying and has gained confidence in his own knowledge.

The system has been proved by experience, leads to remarkably few accidents and produces pilots of a very finished type from any reasonably suitable material. It depends for its success firstly and chiefly on the quality of those who act as instructors and to a less degree on the use of a suitable type of aeroplane.

The requirements for instructors are that they shall be as nearly as possible perfect pilots, that they shall know and be able to explain exactly how and why they perform any given manoeuvre, must be fond of flying, and must be tactful and sympathetic with the difficulties of their pupils.

## THE INSTITUTE OF TRANSPORT.

On Monday, Feb. 13th, a paper by Sir Henry White-Smith, C.B.E., on the "Development of Commercial Aviation" was read before the Institute of Transport. The paper gave a clear and concise statement of the present position of Civil Aviation both in this country and abroad, and was illustrated by a very complete set of traffic statistics for this country during the three years of Civil Aviation.

The present state of ground organisation, the necessity for, and the steps which are being taken to secure, improved ground organisation such that night and fog flying shall become practicable were clearly dealt with. Finally the importance of continued efforts to develop commercial air transport, both by improved organisation, lowered operating costs, and proper attention to such matters as passenger comfort, adequate provision for passengers' luggage, and for adequate publicity to acquaint the public generally with the value of air transport was emphasised. Unfortunately members of the Institute did not feel themselves competent to discuss the subject, and the discussion was confined to visitors more or less directly interested in aeronautical affairs.

Those who spoke in the discussion were Lord Gorell, General Sir Sefton Bragg, Col. Bristow, and Commander Bird (Supermarine Aviation Works). The discussion was

largely an echo of the late Air Conference, and although it may have been of appreciable value to the non-aeronautical section of the audience, did not on the whole supply any novel ideas.

Commander Bird alone touched upon a subject which has never yet been adequately ventilated in public—the astonishing neglect of the commercial possibilities of the seaplane on overseas routes, and in making his plea before an assembly of transport experts it is possible that he may have produced a very much greater impression than is likely to be made before any purely aeronautical assembly, for in such an assembly there is always an overwhelming majority who, having no practical acquaintance with seaplanes, are nevertheless convinced that seaplanes are necessarily inefficient and relatively useless appliances.

## THE INSTITUTION OF AERONAUTICAL ENGINEERS.

NOTES.



The Council of the Institution of Aeronautical Engineers have received an invitation from the Students Section of the Royal Aeronautical Society inviting all members of the Institution to their lectures. The Council desire to express their thanks and extend a very cordial invitation to all members of the Students Section to attend all the fixtures of the Institution and to take part in the discussions.

Attention is drawn to Lieut-Col J. T. C. Moore-Brabazon's paper on the "Early Days of Aviation," which he will read at the Royal Society of Arts, John Street, Adelphi, on Thursday, Feb. 23rd. As many of the events of those early days are now almost forgotten this paper will be of historical interest. Tickets may be obtained by all who are interested from the Secretary of the Institution of Aeronautical Engineers, 60, Chancery Lane, W.C.2, or at the door on the day of the meeting.

## THE ROYAL AERONAUTICAL SOCIETY.

A meeting of the Students Section of the Royal Aeronautical Society will be held on Thursday, Feb. 23rd, at 7 p.m., in the Library of the Royal Aeronautical Society, 7, Albemarle Street, W.1.

Paper by Mr. G. R. Irvine on "Some Possible Improvements in Engine Installation." Chairman, Mr. Alan E. L. Chortlon, C.B.E., M.I.C.E., M.I.M.E.

## LECTURES AT CAMBRIDGE.

The general meeting of the Cambridge University Aeronautical Society will take place on Feb. 22nd, when the usual officers will be elected.

The programme for the rest of the term is as follows:—  
March 1st.—Mr. H. R. Ricardo, "High Altitude Engines."  
March 8th.—S/Ldr R. M. Hill, M.C., A.F.C., "Aerial Manoeuvre in its Relation to Modern Flying."  
Dates to be arranged.—Visit to the Aircraft Experimental Station, Martlesham Heath. Visit to the Royal Aircraft Establishment, Farnborough.

## A RUDGE SCORE.

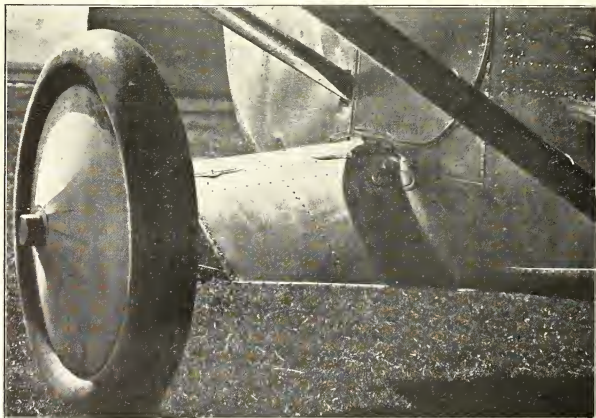
On Dec. 14th, at a general meeting of the Institution of Automobile Engineers, the Crompton Medal awarded annually for the best paper of the Session was presented to H. L.

Heathcote, Esq., M.Sc., F.I.C., Chief of the Research Laboratories, Rudge-Whitworth Ltd., for his paper entitled "The Ball Bearing in the Making, under Test and on Service," which was read at the meeting of the Members of this Institution on April 27th, 1921.

## A CANTILEVER UNDERCARRIAGE.

The photograph shows the undercarriage of the six-seater Dornier Monoplane type C.3. The main member of the undercarriage is a sort of rudimentary wing projecting from the fuselage within which the axle is entirely encased.

The axle is pivoted inboard and supported at its outer ends by shock absorbers. All landing loads are carried by this cantilever structure, and there is a total absence of the usual struts and wires.





## AN APPRECIATION OF THE DH9c.

The following is an extract from a letter recently received from the Compañía Española de Tráfico Aéreo—the Spanish aerial transport company which is running the Seville-Larache Air Line:—

“On the occasion of the completion of the first three months during which we have been operating the first Spanish air service between Sevilla and Larache, we should like to take the opportunity to place on record our satisfaction with the material and personnel provided by you. Using these exclusively, you will be pleased to hear that we have, since the inauguration of our service on October 15th, 1921, till January 15th, 1922, successfully completed 85 return journeys. This represents 42,500 kilometres covered without difficulty or mishap and an incalculable saving in time and increase in regularity over the existing means of transport.”

The above company is using DH9c machines exclusively supplied by :

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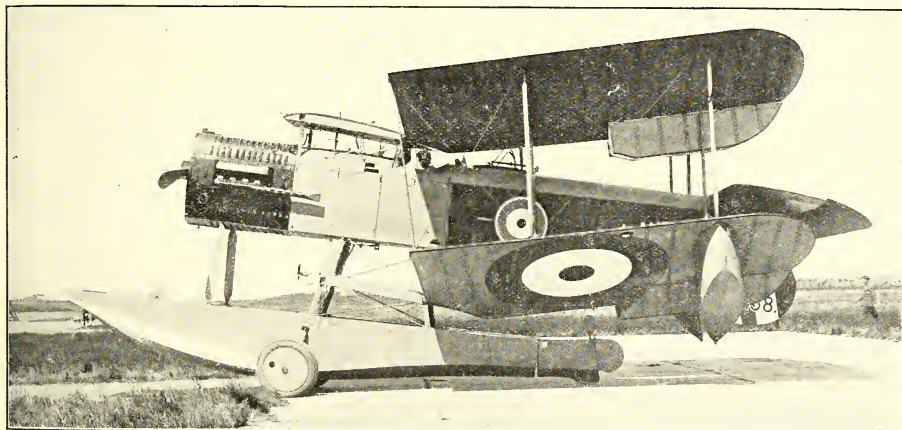
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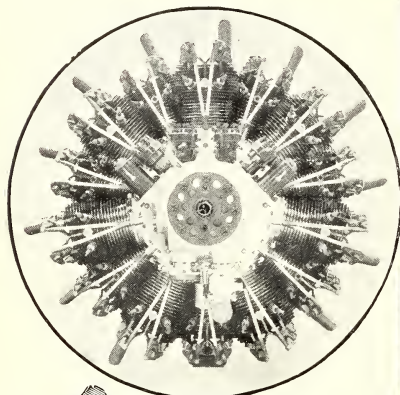
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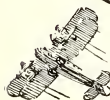
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(Continued from page 132.)

F. L. Butcher, S/Ldr. A. G. Carr, O.B.E., F/Lt. W. S. Caster, M.C., F/O. T. L. Hughes-Chamberlain, S/Ldr. D. C. Evill, D.S.C., A.F.C., F/Lt. A. Garrity, S/Ldr. H. A. Hewat, F/Lt. V. J. Jacob, F/O. H. C. Pyper, F/O. I. M. Rodney, Wing/Cmdr. H. W. Scott, F/O. J. F. Titmas, F/O. E. A. Locke-Waters.

### Aeroplane Experimental Establishment, Martlesham Heath.

The Aeroplane Experimental Establishment, Martlesham Heath, and the detachment at Orfordness, were transferred from the Inland Area to the Coastal Area, with effect from Feb. 1st, 1922.

### Iraq Group.

The Iraq Group, which has formed part of the Middle East Area, became an independent command with effect from Feb. 1st, 1922.

The Officer Commanding, Iraq Group, is directly responsible to the Air Ministry for the command and administration of the Air Force units located in Iraq.

### No. 7 Squadron.

No. 7 Sqdn. has moved from Helipolis to Baghdad, and was transferred for all purposes from the Egyptian Group to the Iraq Group, with effect from Feb. 1st, 1922.

### Withdrawal of R.A.F. Units from Ireland.

It has been decided that as soon as the necessary arrangements can be made, all R.A.F. Units shall be withdrawn from Ireland and the existing Air stations disposed of. With this end in view an advance party of H.Q. No. 11 (Irish) Wing, R.A.F., has been sent from Baldonnell (near Dublin) to Spittlegate (Lincolnshire) for the purpose of opening a new Wing Headquarters there.

Oranmore Aerodrome (Galway) has already been closed down and the unit stationed there, a Detached Flight of No. 100 Sqdn., has been moved to Baldonnell, while "A" Flight of No. 4 Sqdn. has already returned to England and rejoined its Squadron H.Q. at St. Farnborough.

The machines are returning home by air and the personnel and equipment by rail and boat as rapidly as circumstances permit.

### Disbandment of London M.T. Section.

It is notified for information that the Air Ministry Garage, Ebury Bridge Road, S.W.1, closed at midnight on Feb. 5th, 1922, and the London M.T. Section ceased to exist.

### The R.A.F. Memorial Fund.

A meeting of the Executive Committee was held on Feb. 13th. The Committee were unanimously of opinion that the accounts as presented were very satisfactory. All the objects with which the Fund started with the exception of one have been or are being carried out, the one exception being that the scholarships for the sons of officers who fell in the War have not yet materialised, in view of the fact that one of the two houses at Ascot presented to the Fund by Mrs. Soling has not yet been sold and consequently the Committee are holding the proceeds of the sale of the other house until both houses are sold.

The activities of the Fund as regards the distribution of assistance to the needy of all ranks who fought with the Air Force during the War has very greatly increased. The grants made during five months of 1920 roughly amounted to £900, whereas during the year 1921 this sum rose to £4,500.

### R.A.F. Nursing Home.

The R.A.F. Nursing Service now offers opportunities for service abroad and nurses wishing to join this service should therefore be willing, if required, to take their turn at service overseas, generally after a term of Home Service.

Particulars regarding the particulars of service, Regulations, etc., may be obtained on application to the Matron-in-Chief, Air Ministry, Kingsway, London, W.C.2.

### R.A.F. SPORTS AND PASTIMES.

#### R.A.F. Sports Board, March Fixtures.

- 1st.—Hockey.—R.A.F. v. Royal Navy, at Uxbridge (14.45 hrs.).
- 2nd.—Association.—R.A.F. v. Queen's Park Rangers, at Shepherd's Bush (15.00 hrs.).
- 4th.—Athletics.—R.A.F. (Cadet) College v. Queen's College Cambridge, at Cranwell.
- 6th.—Association.—R.A.F. v. Brentford, at Brentford (15.00 hrs.).
- 9th.—Golf.—R.A.F. v. Army, at Sunningdale.
- 11th.—Rugby.—R.A.F. v. Army, at Leyton (15.00 hrs.).
- 15th.—Athletics.—R.A.F. Cross Country Championships, at Uxbridge (15.00 hrs.).
- 22nd to 24th.—Golf.—R.A.F. Spring Meeting, at Porter's Park.
- 27rd.—Association.—R.A.F. v. Army, at Aylesbury (15.30 hrs.).

### The R.A.F. Rugby Team.

The R.A.F. were badly beaten by Devonport Services at Devonport on Feb. 18th by 20 pts. to 3. Playing well together Devonport had the Air Force entirely on the defensive in the first half, but the passing was faulty on both sides. In the second half Devonport improved and added four tries to the two already scored. Attempts were made to open up the game and in the last few minutes F/Lt. Wakefield scored an unconverted try.

The R.A.F. team was as follows:—F/Lt. F. L. C. Butcher; Cdt. E. B. Forster, S/M. Bradbury, F/O. J. K. Smith, and F/O. W. Jones; F/Lt. J. C. Russell and F/O. H. H. Storrs; F/Lt. W. W. Wakefield, F/Lt. S. P. Simpson, F/Lt. R. H. C. L'Her, F/Lt. E. F. Turner, F/Lt. L. Whitworth, F/O. T. L. Lowe, F/O. J. E. L. Drabble, and F/O. C. D. Adams.

### Henlow Notes.

SOCCER.—The R.A.F. Inter-unit Challenge Cup came to Henlow on the 15th inst. It was a great game and everyone of us is proud of our team's achievement. The match itself has been fully reported in the sporting Press, but a fact which escaped observation was that two of our forwards—F/Sjt. Thompson and AC. Vanner—were both virtually cripples and we owe a great deal to their pluck and determination. Sjt. Nicholls played magnificently, his work at back was the outstanding feature of the game.

The Uxbridge left wing, which included Wilson, the Middlesex County forward, was always dangerous, but time and again Nicholls and MacIntyre cleared. Thus L/AC. Shergold was not so frequently troubled in goal as was F/O. Bayes, the Uxbridge custodian. Of Mr. Bayes it is safe to say that there are few goalkeepers in any class of football who are his superior. This time he was worth at least half a dozen goals to his side. That is to say he saved quite six shots which would have left the average Service goalie guessing. Apart from this it was evident that his presence had a moral effect on the Henlow forwards, who are ordinarily an effective scoring combination. They had Mr. Bayes to beat every time and in the effort to find a way past him a number of shots went wide of the net which in ordinary circumstances would have gone between the posts. Shergold, too, was brilliant. But in describing a game during which all the players were full out and which in all respects was in keeping with the highest traditions of Service football, it is perhaps invidious to mention names.

Uxbridge scored shortly after half time and Henlow equalised during the last five minutes of the match; extra time being ordered the I.A.A.D. quickly took the lead and maintained this—amidst terrific excitement—until the referee applied the closure. Our team were carried shoulder high off the ground by their enthusiastic supporters and the tremendous cheering was renewed when Mrs. Higgins handed Sjt. Nicholls the cup and was herself presented with a bouquet of flowers by our valiant skipper.

### Uxbridge.

The semi-final for the R.A.F. Cup was played at Uxbridge on Feb. 9th and resulted in a win for Henlow against Netheravon by 2 goals to 1.

On Feb. 10th Uxbridge drew with Maunston, 3 all after extra time. A feature of this match, which was played at Uxbridge, was a wonderful exhibition of goal-keeping by I/O. Bayes.

BOXING.—Two evenings have been devoted to boxing, the winner of each weight qualifying to represent the Depot in the R.A.F. Championships at Cranwell. The following were the winners:—Fly-weight, Cpl. O'Neill; Bantam, AC. Collins; Feathers, L/AC. Barnes; Light, AC. Ogden; Welter, AC. House; Middle, L/AC. Jackson. L/AC. Jackson had no occasion to show his abilities, no one being good enough to extend him. Cpl. O'Neill won his bout in decisive style. He is a boxer well above the average and should do well at Cranwell.

The R.A.F. Cup Final was played on Feb. 15th at Uxbridge and resulted in a win for Henlow over "M" Depot Squadron by 2 goals to 1.

Both teams were well supported and with a large number of townspeople present there was a good game.

The game opened very fast. "M" Squadron backs were unable to hold the Henlow forwards. Half-time arrived with no score, "M" Squadron having most of the game.

On resuming "M" were quickly away and from some good combination Sjt. Killick scored the first goal of the match for them. Willatts and Wilson, the "M" Sqdn. left wing, delighted the spectators. Cpl. Young at centre half was a tower of strength. Goalkeepers F/O. Bayes and AC. Shergold had plenty of work. Nicholls at right-back for Henlow was always there, his clearing being very fine.

Two minutes from time Weaver of Henlow banged the ball in to equalise, Bayes having no chance to get to the ball at all. Hereabouts Weaver and Wingrove for Henlow were conspicuous.

In the extra time condition told and Henlow scored the winning goal from a breakdown.



### THE ROYAL AERO CLUB.

The annual general meeting of the members of the Royal Aero Club will be held on March 29th, at 3, Clifford Street, at 6 p.m.

The retiring members of the Committee are Maj.-Gen. Sir Sefton Branker, K.C.B., Ernest C. Bucknall, G. B. Cockburn, The Earl of Halsbury, Col. F. Lindsay Lloyd, C.M.G., C.B.E., Lieut.-Col. J. T. C. Moore-Brabazon, M.C., M.P., Lieut.-Col. M. O'Gorman, C.B., Air-Commodore C. R. Samson, C.M.G., D.S.O., R.A.F., Sir Mortimer Singer, K.B.E.

Any two members of the Club may nominate a member to serve on the Committee, provided the consent of the member has been previously obtained. The name of the member thus nominated, with the name of his proposer and seconder, must be sent in writing to the Secretary not less than fourteen days before the annual general meeting.

[For the benefit of members who think that the Club still needs a little further liveliness in its activities one would like to point out that Air-Commodore Samson is now commanding in the Mediterranean, and that therefore his place ought to be filled by an equally live member of Committee. Sir Mortimer Singer, K.B.E., has, so far as one can gather, done nothing whatever for aviation and has displayed no active interest in the subject since he presented the Mortimer Singer Cup in 1913 or thereabouts. Therefore one suggests that he might very well be replaced by somebody who is actively interesting in flying.

Of the other retiring members, the Earl of Halsbury is probably better known to the majority of members as Lord Tiverton. He has done much legal work and is a very valuable person to have on the Committee. Sir Sefton Branker is thoroughly alive to the needs of the Club and should certainly be retained on the Committee. Mr. Bucknall is a habitué of the Club and is very closely in touch with the feeling of the members. Mr. Cockburn is a most valuable technical man, as is Colonel Lindsay Lloyd. Colonel Moore-Brabazon is obviously the Club's proper representative in the House of Commons and Colonel O'Gorman is perfectly invaluable as the Club's representative at all International Conferences and so forth abroad, besides being an ideal committee man.

In the light of this knowledge it would seem that two new members should be elected to the Committee to replace Commodore Samson and Sir Mortimer Singer, but that all the others should be re-elected.—C. G. G.]

### SPREADING THE GOSPEL.

A very cheery letter from Mr. Alan Cobham dated Feb. 10th from Sicily gives some particulars of his extraordinary tour with Mr. Sharpe and the D.H.9c with the Siddeley "Puma" engine. So far he has been over France, Spain, Morocco, Algeria, Tunis and now Italy. After Italy he was going on to Athens, Constantinople and so home. The Siddeley "Puma," he says, was then going well, having done about 70 hours' flying without trouble. At the time of writing the machine was still using the same tail skid but he did not think he would complete his 11,000 mile tour without changing it. The D.H.9c itself was behaving excellently.

Mr. Cobham excuses himself for a brief letter by saying that he is a trifle busy. One can quite believe it seeing that he is his own mechanic and will not allow anybody to touch the machine but himself, which he thinks is the only safe thing to do on a tour of this kind. Over and above this he has to keep the accounts, write up his logs, and look up his maps for the next day's flight and forward various information for the people at home after he has finished his day's flying and mechanical work.

One comic incident of the tour occurred in Gerona in Spain where on landing in a small field the machine was surrounded by small peasant children who pressed round and insisted on pushing their fingers into the pilot. Careful enquiries elicited the fact that Mr. Cobham was considered as a sort of super-man, having come down from the sky, and that touching him would bring good luck and all sorts of blessings on the toucher. Curiously enough a similar kind of belief exists in this country although the amount of the blessing generally depends on the amount for which a person is touched.

Another incident occurred at Rabat in Africa where in the evening the conversation turned on the relation between Arabic music and Spanish music. Mr. Sharpe declared that both had the same origin and that the native music of Sevilla was recognisably of Moroccan origin. A professor of the University who was present remarked that he would certainly visit Sevilla one day if only to hear the native songs. Mr. Sharpe asked, "usually how long it would take to fly from Rabat to Sevilla." Mr. Cobham replied that it would take about three hours, so Mr. Sharpe instantly decided that they would settle the question next day. Consequently they left at 08.00 hours, arrived at Sevilla, had a concert for the benefit of the Professor and came back the same day. The journey would have taken at least seven days by ordinary land and boat methods of conveyance.

Thereafter the D.H.9c took the tourists to Tiznit, at the foot of the Atlas Mountains, where the crew were the first

European civilians to enter the town. They were told afterwards that if they had missed the town and landed 10 kms. farther on they would certainly have been murdered. The 9c was also the first civilian aeroplane to arrive at Touggourt in the Sahara below Biskra.

On leaving Africa the tourists had a flight of an hour and a half over the Mediterranean from Tunis to Sicily which was not half as disturbing, Mr. Cobham says, as a bump which they received later when flying to the windward of Mount Vesuvius. There they happened to get into an up-draught consisting chiefly of sulphur fumes, and in about 30 seconds were shot up 1,000 feet.

[Since this letter was received it has been reported that Mr. Cobham and Mr. Sharpe fell into the Adriatic owing to thick fog preventing them from seeing a landing place on the coast. Both were retrieved unhurt.—Ed.]

### A VISIT TO D. NAPIER AND SON LTD.

On Thursday last D. Napier and Son Ltd. invited a large and influential gathering to their works at Acton to see the various processes in the making of the 450-h.p. "Lion" and the 1,000-h.p. "Cub."

Among those present were Lord Gerdil, Sir F. H. Sykes, General Fitting, Sir William Bull, M.P., Sir W. Joynton-Hicks, M.P., Lt.-Col. J. T. C. Moore-Brabazon, M.P., and Mr. A. Baldwin Raper, M.P.

The various machines used in the construction of the "Lion" and the "Cub" were seen in action and all the shops were working hard making engines to be sent all over the world.

The *pièce de resistance* was the 1,000-h.p. Napier "Cub" in action, and a certain aeronautical expert was delighted at the enormous horsepower—1,500—which he read on the rev. counter!!!

One has since learned from a paper that is unintentionally six times more comic than any other morning paper that we saw the "gleaming monster wake to almost incredible life" in "a large, bare, clean shed . . ." "surrounded by attendant priests," etc., etc.

As a matter of fact the engine was running all the time and the shed was not large, and was no cleaner or dirtier than most test sheds, and happily far from being bare it was filled with Napier "Lions" and -going tests.

Seriously, though, the "Cub" is a very fine engine and, as one would expect, it has a very fine bark. One hears that it is to be tested in the air in March fitted to a bomber built of an old established and universally known firm.

A "Lion" in the same shed was being tested at 2,000 revs. and there was another similar engine geared to drive three airscrews simultaneously.

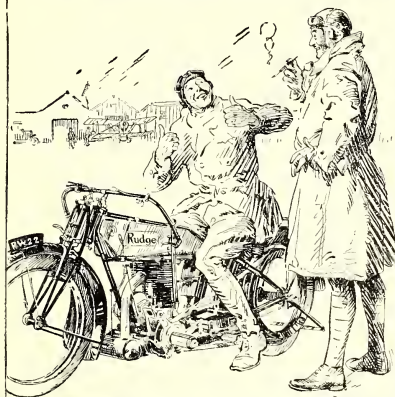
Mr. Vane, managing director of the firm, is to be congratulated on the very excellent arrangements which made the visit of such extraordinary interest and Mr. F. Hazell-Jones on whose able hands the problem of interesting the Press people developed certainly achieved his object with remarkable success. Mr. C. G. Hunt-Winter, who was in charge of the particular party to which one was attached for instruction, discipline and rations, explained everything with great clarity.

One looks forward with eagerness and confidence to the work of the Napier Aero engine in the coming summer.—G. D.



POWER TO SCALE.—A Napier "Cub" reduced to scale alongside a photograph of a 1,000 h.p. locomotive.

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## SMITH'S AVIATION INSTRUMENTS and the Air Conference

The Chinese Charge d'Affaires stated that the Air Mail Service, using British Aeroplanes, was operating daily all over China without any hitch whatsoever.

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# COMMERCIAL AERONAUTICS

## AND CIVIL AERIAL TRANSPORT.



THE UNITED KINGDOM OF GREAT BRITAIN AND IRELAND.

### CONTINENTAL ARRIVALS AND DEPARTURES.

{The following table of arrivals at and departures from the British Air Ports is compiled on the following system:—First air the initials of the Air Line; next the type of machine; next the international number of the machine; next the ports of departure and destination; next the times of departure and arrival; next the cargo, whether goods (G) and/or mails (M); next the number of passengers; and finally the name of the pilot and number of mechanics, if any.}

ABBREVIATIONS:—A.D.—Aircraft Disposal Co. B.A.—Berkshire Aviation Co. B.C.—Bristol Aeroplane Co. B.M.—Brompton Motor Co. C.A.—Department of Civil Aviation. D.H.—De Havilland Aircraft Co. G.E.—Compagnie des Grands Express Aériens. H.P.—Handley Page Transport Ltd. I.L.—Instone Air Line. K.L.—Koninklijke Luchtvaart Maatschappij. L.A.—Leathhead Aviation Services. M.A.—Messageries Aériennes. M.W.—Marconi Wireless Telegraph Co. Ltd. P.O.—Privately owned. P.L.—Petters Ltd. S.F.—Surrey Flying Services. S.M.—Syndicat National pour l'Etude des Transports Aériens (S.N.E.T.A.).

### The London Terminal Aerodrome, Croydon. (Telephone: Croydon 2720.)

#### FEBRUARY 13th:

G.E., Goliath, F-ADDS, London-Paris, 11.45-14.45, G., Nil, Chalembert & I.  
H.P., H.P., G-EATH, London-Paris, 12.07-15.17, G.M., Nil, Rogers & I.  
M.A., Spad, F-ADAE, London-Paris, 12.12-15.15, G., Nil, Paille.  
M.A., Breguet, F-ADRI, London-Paris, 12.16-15.15, Nil, Nil, Briere.  
I.L., DH8, G-EAWW, London-Paris, 12.41, 15.26, G.M., Nil, Courtney & I.  
H.P., DH4, G-EAWD, Paris-London, 11.06-14.24, G.M., 2, Wilcockson.  
G.E., Goliath, F-GEAD, Paris-London, 11.40-14.35, G., 8, Gastoux & I.  
I.L., DH8, G-EAWW, Paris-London, 11.53-14.39, G., Nil, Holmes & I.  
I.L., DH8, G-EARO, Paris-London, 11.52-14.19, Nil, 2, Robins & I.  
M.A., Breguet, F-ADBM, Paris-London, 13.00-16.24, G.M., 2, Charpentier.

#### FEBRUARY 14th:

G.E., Goliath, F-ADDT, London-Paris, 11.39, G., Nil, Gastoux & I.  
H.P., DH4, G-EAWD, London-Paris, 12.10-14.20, G.M., Nil, Olley.  
I.L., DH8, G-EAWW, London-Paris, 12.15-14.49, G.M., 2, Robins & I.  
M.A., Breguet, F-ADBM, London-Paris, 12.50-15.50, G., Nil, Charpentier.  
H.P., H.P., G-EATH, Paris-London, 11.19-14.25, G., 5, Rogers & I.  
G.E., Goliath, F-GEAD, Paris-London, 11.55-14.50, G., Nil, Favreau & I.  
I.L., DH8, G-EAWW, Paris-London, 12.02-14.39, G., 5, Courtney & I.  
M.A., Breguet, F-ADAC, Paris-London, 13.16-16.02, G.M., 1, Delage.

#### FEBRUARY 15th:

I.L., DH8, G-EAWW, London-Paris, 12.47-15.15, G.M., 2, Courtney & I.  
M.A., Breguet, F-ADAU, London-Paris, 12.53-15.49, G., Nil, Delage.  
A.D., Bristol, G-EBAU, London-Bussels, 14.05, Nil, Nil, Herne.  
H.P., DH4, G-EAWD, Paris-London, 12.35-14.50, G., Nil, Olley.  
I.L., DH8, G-EAWW, Paris-London, 12.45-15.49, G., 3, Robins.

#### FEBRUARY 16th:

Nil.

#### FEBRUARY 17th:

G.E., Goliath, F-GEAD, London-Paris, 13.40-17.05, G., 3, Favreau & I.  
M.A., Spad, F-ACMI, Paris-London, 13.35-16.30/18th, G.M., 1, Donnell.

#### FEBRUARY 18th:

I.L., DH8, G-EARO, London-Paris, 12.05-14.25, G.M., 3, Holmes & I.

### The London Terminal Aerodrome.

Owing to the unsettled weather there has not been so much flying as usual during the past week.

For the Aircraft Disposal Co. Mr. Herne on a Bristol went to Brussels on Wednesday. He arrived back by ground methods and the following day he was testing a D.H.9.

On Friday Mr. Stocken brought an F.4 Martinsyde back from Brussels, which machine Mr. Perry was testing on the Saturday.

Last week one made certain remarks about Mr. Courtney having a certain difficulty with his wireless and one cast certain aspersions at the wireless arrangements. One has since learnt that Mr. Courtney's wireless was working perfectly and that it was the wireless of another pilot with which the difficulty was experienced. This was entirely due to jamming and was certainly not due to any fault of the ground personnel of the wireless people at Croydon.

One would like to say here that all remarks about inefficient wireless apply entirely to what has not been done in the way of intermediate organisation on the air routes by the Department of Civil Aviation, but most certainly not to the personnel of the Croydon wireless plant who have always worked hard, efficiently and unceasingly and have kept late hours at the aerodrome in order to make the present wireless

H.P., H.P., G-EATH, London-Paris, 12.15-14.50, G., 10, McIntosh & I.  
M.A., Spad, F-ACME, Paris-London, 14.25-17.37, G.M., 1, Briere.

#### FEBRUARY 19th:

I.L., DH8, G-EAWW, Paris-London, 11.50-15.05, G., 2, Courtney & I.  
I.L., DH8, G-EARO, Paris-London, 12.00-14.39, Nil, 4, Holmes & I.

### Inland Flying at Croydon.

Feb. 13th.—G.E., Vimy to Brooklands (Cockerell & I.); P., S.E.5 from Bokesbourne (Wigglesworth); P., S.E.5 test (Muir).

Feb. 14th.—I.L., Vimy to Brooklands, R.Ae.C. Avro joy-rides (Donham Carter); S.F., Avro joy-rides (Muir).

Feb. 15th.—M.W., Avro test (Shaw); H.P., Bristol tests (Uwins and McIntosh).

Feb. 16th.—M.W., Avro test (Shaw); A.V. Roc, Avro from Hamble (Hinkler); L.L., D.H.18 test (Barnard).

Feb. 17th.—A. V. Roe, Avro to Hamble (Hinkler); C.A., D.H.18 from Stag Lane.

Feb. 18th.—M.W., Avro test (Shaw); R.Ae.C., Avro joy-rides (Bonham Carter).

Feb. 19th.—I.L., D.H.18 test (Powell).

### Flying by The Aircraft Disposal Co.

Feb. 13th and 14th.—Nil.

Feb. 15th.—Bristol "Fighter" G-EBAU, Brussels (Herne).

Feb. 16th.—D.H.9, G-EBAR, test (Herne).

Feb. 17th.—Martinsyde F.4, G-EAZB, from Brussels (Stocken).

Feb. 18th.—Martinsyde F.4, G-EAZB, test (Perry).

### Cross-Channel Statistics.

Week ending February 19th:—

Machines, 39; Passengers, 57; Crews, 47; Total Personnel, 104

Corresponding week last year:—

Machines, 29; Passengers, 32; Crews, 35; Total Personnel, 67

system a very good friend to pilots in the air, which one is assured by a certain pilot that it is.

Mr. Shaw has been flying the wireless experimental Renault Avro and on Wednesday was demonstrating to Lt.-Col. Plandy and other high officials of the wireless world.

Mr. Muir of the Surrey Flying Services has been flying his Avro for joyride purposes again and on fine afternoons the jeeriders are once again beginning to put in appearances.

The Air Lines are looking for more pilots and one or two have already been given contracts for April.

Some of the new machines will be out next month, when Handley Page Transport expect to take delivery of the new W.8L with Rolls-Royce engines. In addition to this they will use the Napier V.8 which has been thoroughly overhauled and parts have been reconstructed from data obtained from its recent work on the service.

The first D.H.34 (Napier) will be flying some time before Mr. 15th and the D.H.32 (Rolls-Royce) some time in April. Both these machines should therefore be seen at Croydon soon after the Stag Lane tests.

The Napier Vickers Vimy of Grands Express which arrived from Paris the previous week was taken by Mr. Cockerell to Brooklands on Monday. The "City of London" Vimy fol-

# INSTONE AIR LINE

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lowed the next day. This latter machine is to undergo its periodical rejuvenation.

On Wednesday Mr. Uwins was giving Mr. MacIntosh some instruction on the Bristol ten-seater. This machine taking off reminds one somewhat of a pig with its snout in the air nosing its way along. As Mr. Uwins was taking the machine into the shed past the level crossing he unfortunately hit the "baby tank" which tows the Handley Pages from the sheds to the Customs enclosure and slightly damaged a wing tip.

The Royal Aero Club machines are doing quite a lot of flying. Mr. Bonham Carter, another Cranwell cadet, took his R.Ae.C. ticket on an Avro, which machine he was again flying on Saturday.

The new D.H.18 G-EAWX returned to Stag Lane the previous Saturday and came over again on Thursday.

Mr. Wieglesworth came over from Canterbury during the week on the S.E.5a which he has converted to take a 90-h.p. R.A.F. engine. The machine seems to function exceedingly well. Mr. Muir took it up for a short flight and said that it was very nice to fly and it seems that it can be landed in a very small space. The machine was still at the aerodrome on Saturday.—C. D.

### The London-Brussels Route.

The Air Ministry announces in Communiqué No. 755:—

As the proposals for the operation of the London-Brussels service made by the Syndicate approved for subsidy have not matured, the "approval" which had been provisionally given has been withdrawn.

Applications for the operation of this service, which should be forwarded to the Secretary, Air Ministry, Kingsway, W.C.2, before March 1st, are therefore again invited, on the understanding that only one firm will be subsidised on this route during the present year.

The assistance to be given by the Air Ministry will be on the lines already announced; detailed information with regard to these can be obtained on application.

### The Cairo-Baghdad Air Mail.

The Postmaster-General states that the Air Mail which was dispatched from London on Jan. 26th reached Baghdad on Feb. 5th.

The next Air Mail to Baghdad will be dispatched from London on Thursday, Feb. 23rd.

### Market Drayton.

The Berkshire Aviation Co. Ltd. began flying here on Wednesday last from Sych Farm meadow. Several cross-country flights have been made to Hawkstone Golf Links and quite a number of landowners have satisfied their desire to see their farms from the air.

On Sunday, in spite of a steady drizzle, 35 passengers were carried and 250 people paid for admission to the ground. At 4.30 flying was abandoned owing to the bad weather, the clouds being only 150 feet high.

A deputation of local preachers and clergy having decided that no one should obtain money on the Sabbath except themselves proceeded under cover of darkness on Saturday night to the owner of the field and impressed upon him the frightfulness of Sunday flying. The farmer, having been successfully hypnotised by the clerics, was a somewhat difficult individual to encounter in the morning, but, eventually common sense prevailed and flying carried on as usual.

### Nantwich.

The B.A. Co. Ltd. finished their air propaganda work here on Tuesday, having had a successful time among some of the best sportsmen they have met for years.

Sixty-six passengers were carried on Sunday, Feb. 12th, and during the weekdays an average of 24 was kept up. This is quite good for winter flying and compares very favourably with previous years. A great number of farmers had flights, several of them winning bets of ten pounds and over for making a trip!

Several ponds on adjacent fields afforded the firm plenty of fun in the form of skating, "Wilfred" enjoying himself as much as anyone.

### Aviation in Wales.

To satisfy an execution issued by the bailiff against the Welsh Aviation Co. Ltd., four Avro aeroplanes were offered for sale at a public auction at Swansea on Wednesday. The machines went very cheaply. Three with 120-h.p. Le Rhone engines fetched £50, £40, and £30, respectively, and one with 80-h.p. Renault engine was knocked down at £12 10s. They are all purchased by the same buyer, Mr. Evan Williams, a turf accountant of Neath.

## AIRCRAFT IN PARLIAMENT

### SILENCERS.

On Dec. 17th Capt. WEDGWOOD BENN asked the Secretary of State for War whether his attention had been called to the invention of a new silencer for air engines; and whether there is any likelihood of its

general adoption. Capt. GUEST replied that various types had from time to time been brought to the notice of the Air Ministry and that the more promising ones are subjected to tests, including full scale tests on actual aeroplanes, and that these tests are still proceeding at the R.A.E., Farnborough.

On Feb. 14th, in reply to a question by Mr. RAFTER, the SECRETARY OF STATE for AIR said that 99 officers are employed in the Accountants Section of the Stores branch of the R.A.F., 10 of them are ex-pilots or observers, and none of them are non-service men. It was not considered desirable in view of the need for obtaining officers with the most accurate experience in the interests of economy and efficiency to restrict entry to ex-pilots and ex-observers to the exclusion of other candidates from the three services who possessed the necessary qualifications.

### INDIAN AIRSHIP SERVICE.

Mr. MONTAGU, Secretary for India, replying to Sir J. D. REES on Feb. 14th, said that he had been informed by the Government of India that they regret that the present financial position precludes them from making any contribution to the establishment of the experimental Imperial airship service which has been proposed.

## PERSONAL NOTICES.

### DEATHS.

MILNES.—On Feb. 14th, killed while flying near Madrid, Spain, P. D. S. Milnes (Reggie), second son of Mr. and Mrs. P. W. Milnes, of Lee, Kent, aged 24.

ORTWELER.—On Feb. 14th, at Madrid, the result of a flying accident. Frederick John Ortweiler, M.C., R.A., eldest son of Mr. and Mrs. S. Ortweiler, 23, Cavendish Road, Huddersbury.

### THE QUATRO VIENTOS ACCIDENT.

It is with very great regret that one has to record a fatal accident at the Quatro-Vientos Aerodrome, Madrid, in which Messrs. F. J. Ortweiler, P. D. S. Milnes, and H. B. Richardson were killed. The accident occurred to Mr. Richardson, and Messrs. Ortweiler and Milnes were in the back seat. It took off on a climbing turn and when at a height of about 60 ft. it stalled and nosed over.

The accident appears to have been somewhat similar to that which occurred to Mr. Forrester-Walker at Croydon lately, except for the fact that the machine in Spain seems to have fallen from a greater height and to have hit nose-on. The fuselage broke at the pilot's seat and the whole machine was wrecked.

No information is available at present as to why the accident occurred or whether there was engine trouble.

Mr. Frederick Ortweiler had a distinguished career in the R.A.F. He won the M.C. and was towards the end of the war brought down in the enemy's lines. He succeeded in escaping, but was recaptured and imprisoned on an island in the Baltic. From here he managed to get away concealed as a stowaway and returned to England.

After the Armistice he went up to King's College, Cambridge, and while here he acted as chief pilot to the now defunct Cambridge School of Flying. His next move was to become pilot to the photographic machine belonging to the Aircraft Manufacturing Co. After that firm closed down Mr. Ortweiler did the same work for the De Havilland Co., and also some flying for Mr. Chapman's firm at Croydon.

Some time ago he joined the De Havilland Co. as a test pilot and did a large amount of flying for them.

He coached the Cambridge Air Team at Croydon in preparation for the Victoria Cup race in July, and distinguished himself in the Aerial Derby by his flying of an S.E.5a, on which he was the first to pass the post. Owing to a mistake in the rounding of a pylon he was disqualified, and increased his reputation as a racing pilot in the first Croydon race meeting last Autumn.

Mr. Percy Douglas Sturt Milnes, universally known as "Reggie" Milnes, was a well-known and popular figure at Croydon. He learnt to fly at the beginning of 1918 and had much experience of long-distance flying in Egypt and Palestine. He joined Aircraft Transport and Travel Ltd. in the Summer of 1920 and did much flying for that firm on the Paris and London routes.

After they closed down he rejoined the R.A.F. during the strike emergency, last March, and went to Eastchurch. He was demobilised in July and since then has done a certain amount of flying both to and in Spain.

He was one of the most popular figures at Croydon, and besides being in the very front rank of pilots he had an excellent knowledge of rigging and engines. He had a great personal charm which endeared him to all who knew him, and very great things were expected of him in the future of Civil Aviation.

Mr. Herbert Brian Richardson was a very experienced pilot and won the M.C. during the war. He passed through the "Gosport" course at Shotwick and instructed on dual "Camels" and all service types to D.H.6.

He has taken various machines to Spain for the Aircraft Disposal Co. and one or two for the Bristol Aeroplane Company. He was lately made instructor to the Spanish Government.

To the relations and friends of all three pilots one offers very sincere sympathies. The world of aviation has lost three most valuable workers.—G. D.

### ENGAGEMENTS.

TYPER—WRIGHT.—The engagement is announced of F/O. H. C. Typer and Nancy, youngest daughter of Mr. and Mrs. H. Graham Wright, White Lodge, Rushlip, Middlesex.

TOPPING—WHITE.—The engagement is announced of W. Topping, M.Sc., Lt., R.A.F., of Toronto, and Agnes Helen, eldest daughter of the late Arthur F. White and Mrs. White, Cockham Den, Cheshurst.

### BURNS.

HOLLIS.—On Feb. 17th, at 8, St. Michael's Villas, Cardigan Road, Leeds, the wife of Arthur Hollis (late 19th Hants and R.F.C.)—a daughter.

MCLINTOCK.—On Feb. 14th, at Tresco, Brixington-on-Sea, Molly, the wife of Captain R. S. McClinton, R.A.F.—a daughter.

## TAT-COX and JAMES.

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## THE BUYERS' GUIDE WEEK BY WEEK.

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"Propellers," Leeds. Roundhay 60r (5 lines).....	143
Bristol Aeroplane Co., Ltd., The, Filton House, Bristol. "Avia- tion," Filton. Bristol 3906.....	Back Cover
Fairley Aviation Co., Ltd., The, Hayes, Middlesex. "Airly," Hayes, Middlesex. Hayes, Middlesex 19.....	133
Parvill, George, & Co., Colson Works, Park Row, Bristol. "Warplanes," Bristol. Bristol 4773 (2 lines).....	141
Roe, A. V., & Co., Ltd., Newton Heath, Manchester. "Triplane," Manchester. City 8394r, Manchester.....	Inside Front Cover
Short Brothers (Rochester & Bedford), Ltd., Seaplane Works, Rochester, Kent. "Seaplanes," Rochester. Chatham 627.....	Inside Back Cover
Supermarine Aviation Works, Ltd., The, Southampton. "Super- marine," Southampton. Woolston 37 (2 lines).....	Inside Back Cover
Westland Aircraft Works, Yeovil. "Aircraft," 141 Yeovil. Yeovil 141.....	134
<b>AIR LINES.</b>	
Instone, S., & Co., Ltd., 51, Leadenhall Street, London, E.C.	
Avenue 3567-8.....	144
<b>ALUMINIUM PISTONS.</b>	
London Die Casting Foundry, Ltd., The, Tremlett Grove, Junction Road, Holloway, N.19.	
"Charcoal," Uphol, London. Hornsey 1580 (2 lines).....	148
<b>BUILDING MATERIALS.</b>	
Sankey, J. H., & Son, Ltd., Essex Wharf, Canning Town, Lon- don, E.16. "Sankey," Canning Town. City 5077 (2 lines).....	145
<b>CORDS, THREADS, TAPES AND WEBBING.</b>	
MacLennan, John, & Co., 115, Newgate Street, London, E.C.1. "Vandura," Cent. London. City 3575.....	Front Cover

## DOPES.

Celton (Richmond) Ltd., 22, Cork Street, London, W.1. "Ajawb," Reg. London. Gerrard 440 (2 lines).....	142
Titanine, Ltd., Empire House, 175, Piccadilly, London, W.1. "Tetrafree," Piccy, London. Gerrard 212, Regent 4728.....	Front Cover & 139

## ENGINES.

Armstrong Siddeley Motors, Ltd., Coventry. "Sidarm," Coventry. Coventry.....	142
Bristol Aeroplane Co., Ltd., The, Filton House, Bristol. "Avia- tion," Filton. Bristol 3906.....	Back Cover
Nauher, D., & Son, Ltd., 60, New Beulton Street, London, W.1. "Nutrifur," London. Gerrard 826 (4 lines).....	137

## FLOTATION AIR BAGS.

R.F.D. Company, 21, Queen's Road, Hershman, Surrey. Escher 395.....	148
--	-----

## INSTRUMENTS (Speed Indicators, etc.).

Smith, S., & Sons, Ltd., 120-125, Great Portland Street, London, W.1. Mayfair 6350 (6 lines).....	145
--	-----

## MOTOR BICYCLES.

Rudge-Whitworth, Ltd., Coventry. "Rudge," Coventry. Coventry 1104.....	145
---	-----

## STEEL TUBING.

Accles & Pollock, Ltd., Oldbury, Birmingham. "Accles," Old- bury. Oldbury 111.....	145
---	-----

## TEST PILOTS.

Tait-Cox & James, c/o S. Hockstall Smith, F.R.Ae.S., 4, Golden Square, London, W.1. Gerrard 3489.....	147
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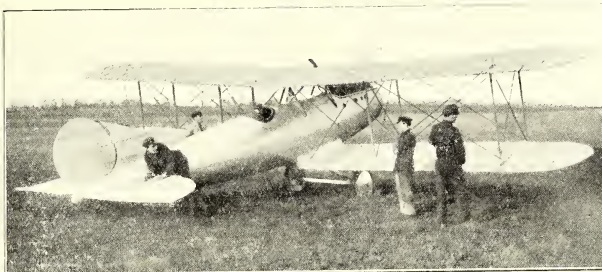
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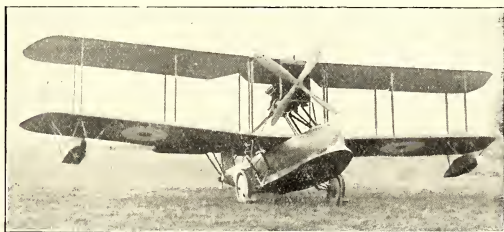
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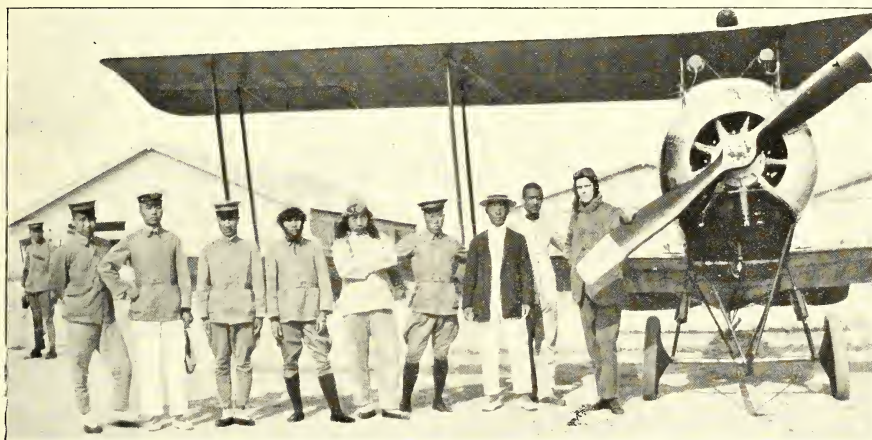
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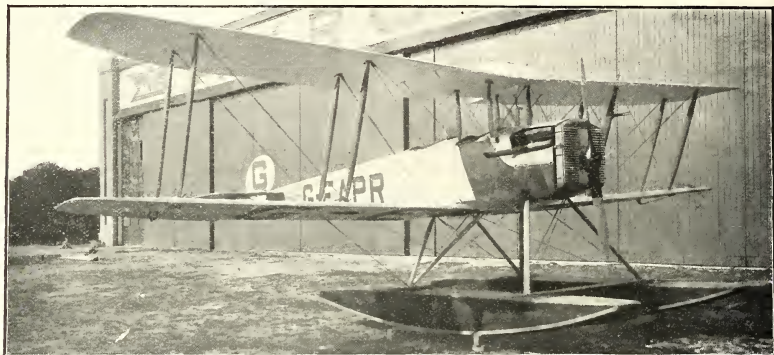
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## ON THE LOSS OF THE "ROMA."

All the British aeronautical community will sympathise deeply with the U.S. Airship Service on the loss of the "Roma," not merely on account of the deaths of so many good comrades but because of the set-back to airship work in the United States which is sure to follow and because of the loss of the experience and knowledge which had been acquired by those who have died. The officers and men who were killed died doing their duty as did the American and British officers and men who were killed in the wreck of R.38. Their relatives and friends have at least the consolation that no man can ask for a better death.

The human mind is a queer thing and utterly illogical in spite of all our philosophy and education. Intrinsicly there is no more reason for focussing the attention of the World on the wreck of the "Roma" or the R.38 than on any train wreck in which as many people are killed. Yet one does not recall that when, as happens several times in the year, an American train is derailed and catches fire and burns to death a number of passengers, the railway directors and Ministers of Communications or of the Boards of Trade of other nations send telegrams of condolence to the directors of the lines concerned. Nor can these international manifestations of sympathy be explained by the fact that the victims of the accident belonged to a fighting Service, for one cannot recollect that when U.S. Army patrols have been cut up by Mexicans or by Indians (as when Custer's force was wiped out by the Sioux—if one's memory is correct), or when British detachments have been rushed by Pathans or Arabs or Dervishes, there has been any despatch of condolatory telegrams by friendly Powers.

Even if one argues that there is a difference between the death of Service personnel in action and their death in a sheer accident in time of peace that does not altogether account for the international sympathy displayed. Officers and men have died in submarine accidents, destroyers have broken their backs and sunk with all hands, troop-trains have been wrecked with serious loss of life, and other forms of Service accidents have occurred without attracting the sympathy or attention that results from an airship wreck.

We have lost during the past few months several valuable officers and men in aeroplane accidents and the U.S. Air Services (Army and Navy) have lost still more. The Royal Navy has lost several men at a time through the capsizing of picket-boats or leave-boats, and so, doubtless, has the U.S. Navy. The British Army has lost officers and men through premature bursting of shells in artillery practise and through accidental discharge of firearms. Yet the two nations have not exchanged telegrams of sympathy.

To bring the comparison still closer let us recall the fact that five or six very distinguished American officers and officials were killed last year in a crash with a Curtiss Eagle at one of the U.S. Air Service aerodromes in a thunderstorm. Also last year an officer of the R.A.F. and four men were killed in a crash in a Vickers "Vimy" at Manston. And the year before several officers and men were killed or burned to death in a Handley Page at Andover. Yet there were no international condolences.

Is it possible to discover in any way the precise line which marks the limit between a catastrophe of international importance and ordinary death on duty? Why should the deaths of thirty or forty people be of greater international moment than the deaths of three or four.

### A Matter of Custom.

The answer is that the limit varies according to the number of deaths and according to the manner of death. That is to say, when people become accustomed to being killed in a particular way that particular way of being killed ceases to be of interest. There was a time when a single death in an aeroplane accident filled a column in every newspaper. To-day such a death may be given half a dozen lines or it may be ignored altogether, unless it be that of some newspaper favourite.

A ship may sink with all hands and never appear at all

except as a "total loss" in one line in the shipping news, unless it happens to be a popular passenger liner. Similarly the time will come when an airship will disappear in the course of a voyage to South America or Australia and merely be logged as "missing," without anybody being distressed except the relatives of the crew. And when that time comes we may reckon that airships are a recognised success.

In the meantime those who go up to the air in airships are pioneers of a new method of transport and as such those of them who die are entitled to the homage due to men who give their lives for the ultimate good of humanity.

### Theory and Practice.

The "Roma" accident, as may be seen from the more or less technical account which follows hereafter, was a wholly avoidable and peculiarly silly accident, just as was the accident to R.38. It was one of those affairs which was probably unforeseeable and yet ought to have been foreseen. It was unforeseeable merely because there is no proper method of communicating experiences between the very people who ought to be in communication.

The experienced practical men are, unfortunately, precisely those who are physically incapable of putting their experiences on paper or of delivering lectures to learned societies or of getting up and making speeches at Conferences. It is only when an accident of this kind occurs that somebody by chance comes across one of the un-vocal practical men who knew all along that such an accident was likely to occur. Just as after the R.38 wreck one met several people who knew all about those weak girders and as in this case one met a practical airship officer who knew of these over-balanced elevators.

It makes one wonder how many lives could be saved and how much progress could be accelerated and how much more could be achieved with the small amount of money available if instead of spending so much on subsidies to civil aviation and on "Kingsway majors" and on inefficient technical "experts" the Air Ministry were to discover some sound practical man with a gift for getting people to talk and appoint him to collect and circulate all the odd useful bits of information which are at present known only to the few. One of the chief ambitions of this newspaper is to do precisely such work when trade improves so much that it can afford the additional pages necessary to accommodate the information thus acquired.

### Analogous Accidents.

So far as the accidents to the R.38 and the "Roma" are concerned, they will in no way affect the faith of those who believe in the future of air transport. Neither accident in any way proves anything against the usefulness of the airship as such or against its safety.

The R.38 affair was precisely analogous to the case of a railway engine or an automobile with a weak frame or axle which breaks and causes a wreck which catches fire, as many hundreds or thousands have done. The "Roma" affair was exactly similar to that of a car with steering angles so badly designed that on turning through too small an angle the front wheels take charge and throw the car into a ditch before it can be stopped—having once owned such a car one can appreciate the point.

In neither case was the accident one to which an airship as such is peculiarly liable. Similar accidents have occurred and will occur again to all sorts of vehicles.

### Overcoming Obstacles.

As regards the set-back to airship work in the States one may perhaps be acquitted of the charge of cynicism if one states one's belief that it will be for the ultimate good of airship development. Since the Armistice the airship people in America have had an easier time than those of any other nation. The Germans have been forbidden to build airships by the spiteful decrees of the Commission Aéronautique Inter-Alliée. The British have been cut down to little or nothing by a short-sighted Government which has squandered money recklessly in a thousand useless ways. The Italians have had

no money at all. And the French have had very little. The Americans alone have had pretty fair sailing.

Now the peculiarity of the Anglo-Saxon, thanks to his purely Teutonic origin, is that unless he meets with strong opposition he will never do his best. Which is why the Teuton is in reality the master of the World. But give the Teuton an easy time and he is the laziest person on Earth.

One does not for a moment suggest that the American airship people have been lazy. Far from it, for they have had plenty of official and technical and practical obstacles to overcome. But one does distinctly believe that having now come up against a solid wall of ignorant prejudice on the part of Senators, Congressmen, pressmen, and public, besides the stupider elements in the U.S. Army and Navy, those who believe in airships will be roused to that fine *furore Germanicus* which has carried the Anglo-Saxon so far in the past and so will in their next advance after overcoming their present obstacles go further than they would have done had there been no opposition.

Under no circumstances does the American display his English origin so clearly as in adversity. It is in time of American newspaper office, transmitted by cable to Europe, translated into English, written up by a London journalist and revised by a London sub-editor, there can be no possibility of relying on anything in the story as ultimately published except the bare outstanding facts on which all the various mis-reported and mangled stories agree.

### THE PROBABLE EXPLANATION.

The explanation of the "Roma" accident appears to be perfectly simple, despite all the amazing theories which have been put forward by experts in the Press. Naturally the accounts of the accident which have arrived here have been either hopelessly foolish or altogether futile. When a description is written by an American reporter, sub-edited in an American newspaper office, transmitted by cable to Europe, translated into English, written up by a London journalist and revised by a London sub-editor, there can be no possibility of relying on anything in the story as ultimately published except the bare outstanding facts on which all the various mis-reported and mangled stories agree.

From these it appears indisputable that on Feb. 21st the U.S. Naval Airship "Roma," which had been acquired from the Italians last year as the most up-to-date specimen of the Italian semi-rigid airship, left an aerodrome in the vicinity of Norfolk, Virginia, and was flying over the U.S. Air Service aerodrome known as Langley Field when she suddenly dived, struck the ground and burst into flames. From the various reports it appears that she had on board a crew and passengers amounting to 38 in number and that of these 38 survived.

In spite of the tragedy of the event one cannot help smiling at the report of the Exchange Telegraph Company sent some hours after the occurrence stating that "only 10 so far have been rescued," as if there were still a possibility of rescuing other victims from a wreck which had apparently burnt itself to a cinder a considerable time before. One merely quotes this as an example of the intelligence of the modern journalist.

The "Roma" was built at the Italian Government Airship Factory and made her trial flights over Rome in September 1920. In March 1921 she made a non-stop flight from Rome to Naples and back, having a matter of 52 persons on board. She was bought by the United States Government in February 1921 for 200,000 dollars, and in the course of last year she was taken to pieces, shipped to the States and rebuilt, and made her first flight in America on Nov. 11th.

The "Roma" had a capacity of 1,200,000 cubic feet, a length of 412 feet and a maximum diameter of 82 feet. Her disposable lift was alleged to be 16 tons. She was fitted with six Ansaldo engines each of 400 h.p., and her speed was supposed to be 68 miles per hour.

### American Alterations.

It is reported from America that the Ansaldo engines were not satisfactory in the cold climate, and moreover there were no Ansaldo spares in America. Consequently these engines were changed for six "Liberty" engines, partly in view of the fact that all America is strewn with spare parts of "Liberty" and partly because the "Liberty" engine does in fact under good conditions give over 400 h.p.

It was calculated that with the "Liberty" engines her speed would be nearly 75 miles per hour. This, one believes, was the cause of the accident.

### A Similar Case.

Just at the end of the War we had in England an "M" type Italian airship fitted with two Iotta-Fraschini engines. This ship was fitted with a multi-cellular box-kite arrangement of rudders and elevators at the stern of the rigid keel in exactly the same way as the rudders and elevators of the "Roma" were fitted. The elevators and rudders in this ship were balanced by a portion projecting in front of their pivots

exactly as they were in the "Roma." In order to increase the speed of the ship the British airship people fitted a third Iotta engine above and between the two original engines.

When this ship was tested with the three engines it was found that owing to the increased speed and shipstream the elevators, which originally had quite as much balance as was safe, were very distinctly over-balanced. The result was that when they were pulled hard up or down the air acting on the balanced portion held them in position so that it was impossible to get them back. It was only by the good luck of the elevators locking at a height of several thousand feet that this Italian ship escaped driving head first into the ground, as did the "Roma."

### What Happened.

Obviously, therefore, what happened to the "Roma" was very simply that with her six "Liberty" engines she got up considerably more speed than she did with the Ansaldo and just by sheer bad luck when she was comparatively near the ground and evidently going at her best speed the elevators were locked in a descending position by the excessive air speed and so drove her into a nose-dive.

The fire may have been caused as reported by the ship touching high voltage electric wires, or it may have been caused merely by the petrol tanks in the forward engine cars bursting and setting fire to the machine, or it may have been caused by the hydrogen from the torn gas-bag being ignited by the exhaust of engines which were still running. There is, however, no reliable evidence so far that the ship caught fire in the air. In fact there are many ways in which the ship could have caught fire in such a crash and there would be very little hope of fire not occurring.

### Ignorant Criticisms.

Some papers report that the American Press criticises the U.S. Airship Service for not having the ship filled with helium. It is also reported that helium was used during her early tests in the States, but that the helium had been emptied from the ship and that she had been inflated again with hydrogen.

If the facts are as stated it may be assumed that the American airship authorities had very good reasons for getting rid of the helium. It may have been that as she was intended to make long cruises to places where helium would not be available it was thought inadvisable to mix helium and hydrogen in case she required re-gassing in the course of her journey.

Moreover, as she was intended to be used for demonstration work and as a school ship it was fairly evident that she could not be kept permanently inflated with helium, which gas is only obtainable in extraordinarily small quantities and therefore it was considered advisable to fill her with hydrogen, which would be her permanent material. In any case it is safe to assume that the U.S. Naval Airship people knew considerably better what was the right thing to do in this matter than do the American newspapers.

### An R.36 Experience.

In connection with this lamentable affair it seems worth while recording the fact that but for good luck and good judgment R.36 would have been wrecked in a very similar way some time in 1921. She was more or less a copy of the German L.77 except for the fact that the vertical and horizontal fins had been built very much thinner in order to reduce their head resistance and improve their streamlines.

The result was that one day, when cruising over Bath with a number of Air Ministry officials on board, the upper vertical fin and rudder buckled and lay over to the starboard side and the starboard fin and elevator also collapsed. The result was that the ship pushed her nose down hard, slid all the lurch off the cabin table, and dropped 3,000 feet before it was possible to stop her, as naturally the buckling of the fins jammed the elevators and rudder controls.

Fortunately the ship was at a height of about 6,000 feet at the time and in the course of the 3,000 feet drop Major Scott, who was the senior officer on board, managed by stopping the engines to keep the ship from dropping any further. He then disconnected the controls of the upper rudder and the starboard elevator, leaving the lower rudder and port elevator as the only effective controls.

As soon as the ship went ahead again the buckled fins with their hanging control surfaces tended to lift the tail aerodynamically and throw the nose down. This was counteracted by bringing the crew aft. In this manner Major Scott navigated the ship all the way back to Pulham and made a perfect landing at about 22.00 hours the same evening. If the ship had been at a height anywhere below 3,000 feet she must inevitably have crashed as did the "Roma."

### An Incident in Germany.

One of our earliest airship officers tells a curious story of a very similar affair with a Parseval non-rigid airship. In these early ships the rudder was the only control surface. The fore



and aft trim was controlled by blowing air into and out of balloons fore and aft.

While cruising in the vicinity of Potsdam the ship was trimmed too heavy forward and started a dive. Before the trim could be restored she had come down on her nose in a field, missing several high-voltage electric cables by a matter of inches and burying the forward end of the car in the ground. Fortunately the car instead of being a flimsy aluminium structure was made of chrome-nickel steel tubes and stood the shock.

The inmates of the car were hurled in a heap to the forward end. The nose of the gas-bag hit the ground and

fortunately the fabric stood the strain with the result that the whole vast bag bounced back like a gigantic tennis-ball dragging the car up with it. And as the whole outfit left the ground once more the voice of an enthusiastic German advocate of non-rigid air-ships was heard from the middle of the heap of tangled humanity in the forward end of the car to shout, "It is not possible that the Zeppelin should do that!"

The pity is that the "Roma" had not as good luck in missing the high-voltage wires, so that her gallant crew could have lived to treat the whole crash as a joke. But so narrow as that in all things in life is the margin between comedy and tragedy.—C. G. G.

### SIR HUGH TRENCHARD ON WIRELESS.

Speaking at a commemoration dinner of the Institution of Electrical Engineers on Feb. 21st Air-Marshall Sir H. M. Trenchard, Bart., K.C.B., D.S.O., A.D.C., responding for the guests, said they depended entirely on what that Institution could do with wireless for the development of aircraft, whether for peace or war.

### THE AIRCRAFT INDUSTRY AND THE BOLSHEVIK GOVERNMENT.

Apparently the most popular joke in the Aircraft Industry at the moment is to ask any important person connected with any British aircraft firm when he expects to deliver his order for the Russian Soviet Government. It seems that Krassin and Co. have been round the Aircraft Industry and have ordered one or two machines from every aircraft constructor who is still on the active list, so to speak, and have held out prospects of orders for several hundreds of similar machines if the samples are satisfactory. Until comparatively recently these orders were supposed to be deadly secrets, or at any rate certain constructors each seemed to think that his particular firm was the only firm thus favoured.

Precisely what these orders indicate is rather difficult to say but they are certainly genuine orders, for one gathers that in the majority of cases the Bolsheviki Government has actually paid for them in advance in gold. Whether the gold is part of that stolen from the massacred Russian aristocracy or whether it is part of the *bona-fide* property of the late Government of His Imperial Majesty the Czar, one cannot tell, nor, in fact, does it matter seeing that the massacred aristocrats and the murdered Emperor have no use for it.

The real question is whether the Bolsheviki Government intend to buy these machines and manufacture copies of them in Russia with the ultimate idea of learning enough to build an enormous air fleet for the invasion of civilised Europe, or whether it is merely a rather clever but fairly obvious piece of propaganda work.

In the latter case the idea probably is that by ordering one or two machines from each firm and holding out the prospect of an order for several hundred, the British Aircraft Industry as a whole may be induced to throw the weight of its influence into persuading the British Government to open up trade with Bolsheviki Russia. So far as one can gather a practically similar policy has been pursued in a great number of other trades in which sample orders have been given to almost every firm in the trade so as to induce that trade to influence the British Government. One can hardly imagine any other reason why the Bolsheviki emissaries should spend some hundreds of thousands of pounds on aircraft when with the same amount of money they could have bought quite a lot of seeds and agricultural implements with which to grow food for the maintenance of the starving proletariat.

At the same time, of course, one is very glad to see the Bolsheviki Government buying British aircraft. Their money, although blood-stained, is at any rate as good as anybody else's, and if they order more aeroplanes afterwards so much the better. On the other hand, if they merely intend to take those machines to Russia and copy them, then it will mean so many more dead Russians, judging by the performances of Russian pilots and air mechanics during the War. For, just as the Yankee used to be of opinion that the only good Indian was a dead Indian, so one is inclined to the belief that the only good Russian is a dead Russian. And if the Bolsheviki instead of trying to copy the machines buy more of them, no doubt the Russian mechanics will soon put the machines into such a state that they will kill their pilots just as the Russian mechanics have succeeded in wrecking the Russian railways and motor-cars under the benign rule of the proletariat.—C. G. G.

### A SPORTING CHANCE.

If among the readers of this paper there happens to be a young sportsman who is keen enough on aviation to put from £400 to £500 into a thoroughly well run Civil Aviation concern which is paying its way quite comfortably one would like to put him in touch with the present proprietor of this concern. If he is willing to work he can get in on a reasonable salary and half profits for such an investment. Knowing the people who are at present running the show one can recommend it as quite a reasonable investment for a sportsman.—C. G. G.

### THE DEPARTMENT OF CIVIL AVIATION.

There seems to be a growing feeling among aeronautical people that when the Air Estimates come to be discussed the Department of Civil Aviation will be more or less thrown to the Treasury lions, or at any rate that the Geddes Axe will be permitted to do a considerable amount of lopping in that Department in order to save the more useful and efficient departments of the Air Ministry from undue shortage of money.

In view of that fact it is interesting to learn that there is a persistent rumour to the effect that Maj.-Gen. Sir Frederick Sykes, Controller-General of Civil Aviation, has been offered an important and well-remunerated appointment in Government service quite apart from aviation.

There is also a rumour that he has been offered a post with handsome emoluments in the City, but one is inclined to disbelieve this, seeing that Sir Frederick Sykes has been a Government official ever since he was quite a young man.

There is, moreover, a distinct feeling in the City that there will be no money forthcoming from the City for Civil Aviation ventures so long as Sir Frederick Sykes remains Controller-General of Civil Aviation. In view of this it is unlikely that if, as rumour has said, Sir Frederick Sykes has been offered a post in the City, that post can have anything to do with aviation.

In any case, all who have come in contact with him will wish Sir Frederick Sykes every possible success in whatever venture he may undertake, outside of aviation. He has personally endeared himself to everybody by his amiability and his evident good intentions. The fact that Civil Aviation has not developed as its advocates hoped that it would is his misfortune rather than his fault.

### EASTER AVIATION MEETING AT CROYDON

The Royal Aero Club will hold an Aeroplane Race Meeting at Croydon Aerodrome, on Easter Monday, April 17th, 1922. The programme of events includes the following races:—

Club Handicap.—For machines Avro type, engine power not to exceed 150 h.p. Distance approximately 24 miles. Entrant of the winner will receive £20. If five starters the second will receive £10.

Second Waddon Handicap.—For machines with a speed of not less than 100 m.p.h. Distance approximately 32 miles. Entrant of the winner will receive £20. If five starters the second will receive £10.

Second Croydon Handicap.—For machines with a speed of less than 100 m.p.h. Distance approximately 24 miles. Entrant of the winner will receive £20. If five starters the second will receive £10.

First Spring Handicap.—For machines occupying the first three places in the Waddon and Croydon Handicaps. Distance approximately 32 miles. Entrant of the winner will receive £40. If five starters the second will receive £20.

In addition to these events there will be a Balloon Sniping Competition open to members of the Royal Aero Club, and a parachute descent.

The entry fee for each of the Handicap Races is £1. The fee, together with entry form, must reach the Royal Aero Club, 3, Clifford Street, London, W.1, not later than 5 p.m. on Friday, April 7th, 1922.

Club Flying Machines.—The following Club flying machines are available for the Races:—B.F. 26 (two-seater) 90-h.p. R.A.F.; Avro (two-seater) 110-h.p. Le Rhone; Avro (two-seater) 110-h.p. Le Rhone; Avro (two-seater) 110-h.p. Le Rhone.

Qualified pilots wishing to take part in the Races may hire any of these machines from the Royal Aero Club at £3 for each event which will include cost of petrol and oil and insurance of machine.

Applications for the hire of these machines should be made direct to the Secretary of the Club.

It is still hoped that the challenge race between Mr. James on the Gloucestershire Aircraft Co.'s "Bamel" and M. Sadi-Lecoq will take place at this meeting. There is also a private challenge race and stunting competition between two well-known pilots both mounted on similar machines which it is hoped may also take place at this or a later race meeting.



## R.A.F. INTELLIGENCE.

## R.A.F. Appointments.

Wing/Cmdr. W. H. Primrose, D.F.C., from No. 6 F.T.S. (I.A.) to R.A.F. Depot (I.A.). 20/2.

Wing/Cmdr. H. L. Reilly, D.S.O., from School of Naval Co-operation and Aerial Navigation (C.A.) to command No. 6 F.T.S. (I.A.), vice Wing/Cmdr. W. H. Primrose, D.F.C. 20/2.

Wing/Cmdr. P. B. Joubert de la Ferte, C.M.G., D.S.O., from Air Ministry (Directorate of Operations and Intelligence) to Air Pilotage School (C.A.) (I.A.). 20/2.

S/Ldr. C. L. Colbran, from H.Q. I.A., to H.Q. C.A. 1/3.

S/Ldr. D. Blair, from H.Q., No. 1 School of T.T. (Boys) (Halton) to H.Q. I.A. 20/2.

S/Ldr. R. S. Maxwell, M.C., D.F.C., from R.A.F. Depot (I.A.) to Air Ministry (Directorate of Training and Organisation). 18/2.

S/Ldr. J. A. Stone, from R.A.F. Depot (I.A.) to H.Q. I.A. 17/2.

S/Ldr. Augustine Sir Ellis, from H.Q. I.A., to command No. 208 Sqn. (M.E.A.). 17/2.

S/Ldr. C. O. F. Modin, D.S.C., from No. 230 Sqn. (C.A.) to command No. 216 Sqn. (M.E.A.). 17/2.

S/Ldr. A. J. Currie, from Record Office (I.A.) to H.Q. (M.E.A.). 17/2.

S/Ldr. H. G. Bowen, from No. 100 Sqn. ("D" Flight) (No. 11 Irish Wing) to R.A.F. Depot (I.A.). 17/2.

F/Lt. E. O'Donovan Cronin, from No. 1 School of T.T. (Boys) (Halton) to Armament and Gunnery School (Cadre) (I.A.). 18/2.

F/Lt. E. N. C. Walkden, from H.Q. I.A., to Central Pay Office, (I.A.). 20/2.

F/Lt. L. H. Pakenham-Walsh, D.F.C., from No. 100 Sqn. No. 11 (Irish Wing) to R.A.F. Depot (I.A.). 20/2.

F/Lt. J. T. T. Forbes, from No. 36 Sqn. (M.E.A.) to No. 14 Sqn. (M.E.A.). 17/2.

F/Lt. R. J. Ahearne, M.C., from No. 1 School of T.T. (Boys) (Hospital) (Halton) to H.Q. (M.E.A.). 17/2.

F/Lt. N. H. McIlrath, from H.Q. R.A.F., Cranwell, to H.Q. (M.E.A.). 17/2.

F/Lt. F. Fernihough, M.C., from No. 14 Sqn. (M.E.A.) to No. 1 Armoured Car Company (M.E.A.). 17/2.

F/Lt. R. W. Dawes, to Inspector of Recruiting (Birmingham) to Aircraft Depot (M.E.A.). 17/2.

F/Lt. R. W. Edwards, from No. 1 F.T.S. (I.A.) to Aircraft Depot (M.E.A.). 17/2.

F/Lt. P. E. Maitland, A.F.C., from School of Naval Co-operation and Aerial Navigation (C.A.) to No. 4 F.T.S. (M.E.A.). 20/2.

F/Lt. J. Nokes, A.F.C., M.M., from Experimental section, Royal Aircraft Establishment (I.A.) to No. 216 Sqn. (M.E.A.). 17/2.

F/Lt. R. H. M. S. Sandmy, M.C., A.F.C., from No. 1 F.T.S. (I.A.) to No. 45 Sqn. (M.E.A.). 17/2.

F/Lt. A. L. Messenger, A.F.C., from Half-pay List to No. 45 Sqn. (M.E.A.). 17/2.

F/Lt. C. R. Cox, A.F.C., from R.A.F. Depot (I.A.) to H.Q. R.A.F., Cranwell. 25/2.

F/Lt. C. J. W. Darwin, D.S.O., from H.Q. R.A.F., Cranwell, to R.A.F. Depot (I.A.). 20/2.

F/Lt. W. B. B. Shaw, from Air Ministry (D. of E.) to Palestine Group H.Q. (M.E.A.). 7/2.

F/Lt. P. B. Hunter, from Half-pay List to Aircraft Depot (M.E.A.). 17/2.

## R.A.F. SPORTS AND PASTIMES.

## The R.A.F. Club.

Group Captain H.R.H. the Duke of York, K.G., G.C.V.O., accompanied by Wing/Cmdr. Louis Grieg, officially opened the R.A.F. Club on Feb. 24th. He was received by Brig.-Gen. R. H. Morc, the chairman Lord Cowdrey Air Marshal Sir Hugh Trenchard, K.C.B., D.S.O., A.D.C., and members of the committee.

## Inter-Service Hockey.

The Army beat the R.A.F. at Aldershot on Feb. 24th by 10 goals to 2. The Air Force goals were both scored late in the second half by F/O Sawyer. The superiority of the Army team was most clearly shown at half back. The R.A.F. team was as follows:—AC.2 Buchanan, goal; AC. Mason and Grp/Capt. Warrington Morris, backs; Capt. Smith, F/Lt. Keeble and F/O Gardner, half-backs; S/Ldr. Evill, F/Sjt. Smith, S/Ldr. Robinson, F/O Sawyer, and F/Sjt. Kiches, forwards.

## The Ad Astra Lodge.

The Ladies' Festival of the Ad Astra Lodge, No. 3808, was held on Feb. 18th at the Café Monaco. Mr. Ernest W. Short, W.M., President, accompanied by Mrs. Short, received the two hundred guests. The toast of "The Ladies" was proposed by Mr. H. J. Bush, 1st Lieut. C.Treas. (Bucks), Secretary, and Brig.-Gen. R. K. Bagnall-Wild, L.R., responded on their behalf.

The Lodge was founded in 1917 by members of the Aeronautical Inspection Department of the Air Ministry.

## The Balance of March Athletics.

24th.—Fencing.—R.A.F. v. Army, at Bertrand's Academy, London (14.30 hrs.).

27th.—Athletics.—Inter-Services Cross Country Championships, at Uxbridge (15.00 hrs.).

31st.—Skill at Arms.—R.A.F. Cadet College v. R.M.A., at Woolwich

## Fencing.

At Cambridge on Feb. 15th, in Epée, Foil, and Sabre contests, the R.A.F. beat Cambridge University with each weapon. The R.A.F. proved successful in the Epée by 5 wins to 4, in the Foils by 7 to 2, and in the Sabres by 8 to 1. The winning team included S/M. Grainger and S/M. Stollery.

## Uxbridge.

RUGGER.—R.A.F., Uxbridge, v. Civil Services played at

Uxbridge, Feb. 1st. A fast and strenuously contested game from start to finish, both teams playing as though the highest honours rested on their efforts. F/O Smith, O/O Clayton and AC.1 Woods were conspicuous on the Depot side, who won 11 points to 3. Civil Services' play warranted a total nearer that of the Depot.

On Feb. 23rd at Halesbury, the School fifteen beat the R.A.F. Depot by 21 points to 3. For the School one of the most brilliant players was C. C. Wakefield, who is a brother of F/Lt. W. W. Wakefield, skipper of the R.A.F.

HOCKEY.—R.A.F., Uxbridge, v. R.E.s., played at Uxbridge, Feb. 1st. Some fine hockey by both teams produced one of the best games seen on the Depot ground this season. Brilliant goalkeeping by AC. Buchman enabled the Depot to draw 2—2.

R.A.F., Uxbridge, v. University College first eleven at Uxbridge, Feb. 8th: Depot won by 7—4.

R.A.F., Uxbridge, and v. University College 2nd, at Perivale, Feb. 8th. University College won by 3—2.

At Wembley on Feb. 25th the Depot beat the Middlesex Hospital by 2—1.

SOCCER.—On Feb. 22nd in the Middlesex Mid-Week Cup League, R.A.F., Uxbridge, beat Northfield Wednesday 4—0.

On Feb. 25th at Wembley the Depot drew 0—0 with L.N.W. Kly. On the same date at Uxbridge the Depot and eleven defeated Harrow Strouds 3—0.

## Henlow Notes.

RUGGER.—Our fifteen accounted for Bedford Town on the 18th by 11 points to 0.

BOXING.—Capt. P. W. Smith has spent a week on the station instructing air men interested in boxing. He also gave lectures and demonstrations which should do much to encourage and promote this sport at Henlow.

SOCCER.—On Feb. 4th "A" team beat Lynton Works, 7—0, and "B" defeated Henlow 5—0, in local league matches. "A" team made the pilgrimage to Uxbridge where, in accordance with expectation, they worked their way into the final for the R.A.F. Cup. Gosport were the victims on the 7th, 4 goals to 1. Netheravon were met on the 9th and beaten 2—1. Accidents and minor ailments have unfortunately taken rather a heavy toll of our men.

HOCKEY.—Hitchin and Letchworth club visited us on the 4th and were beaten, 5—0. This was the first defeat sustained by them during the current season. On the 6th we entertained Bedford County "A" and soundly walloped them 5—0. The County hockeyites only got one bully on our 25 line, did not even score a corner and our goalie got bored so stiff he was nearly mistaken for one of his own uprigits.

RIFLE RANGE.—The range has been a centre of interest every evening during the past fortnight, during which the first round of the inter-barrack room team championship has been shot off. Due to the energy and initiative of S/M. Henderson, there was an entry of 34 teams, each of 8 airmen under a fire leader. The competition includes grouping, application, rapid fire and landscape target practices, and is therefore interesting and instructive.

GENERAL.—Henlow goal averages are keeping up; on Feb. 4th the three teams representing I.A.A.D. registered 20 goals between them. Not a goal was scored by any of our opponents.

Over 60 officers and their lady friends enjoyed a thè-dansant at the mess recently. For the future the mess is to be "at home" on the first Tuesday in each month and rumour has it that several officers, hitherto suspected of being confirmed misogynists, are surreptitiously taking dancing lessons.

Headquarters gave a capital dance on the night of the 10th. Every credit is due to AC.1 Bryant (formerly on the staff of the Hammersmith dance emporium) for the way in which dancing amongst the airmen has improved.

A successful snacking concert was held in the Astra Club on the 10th when Mrs. Warner and Mr. Bret Hayden—two Henlow favourites—were heard to advantage together with several other ladies and officers and AC.1 Ince.

## A RELATIVE ERROR.

Owing to an error in transcription it was reported in the accounts of the Air Conference last week that certain sentiments on Civil Aviation had been voiced by Squadron Leader Roderick Hill. It has since been pointed out that the speaker who made these remarks was Captain C. T. R. Hill, who is a brother of S/Ldr. R. M. Hill. As one happens to agree very cordially with the sentiments expressed by Capt. Hill one can only congratulate S/Ldr. Hill on his brother's remarks and apologise to him for having given honour where honour did not happen to be due. Perhaps one may be excused for the error on the grounds that S/Ldr. Hill has so often delivered eminently sound and practical lectures on flying that there was some excuse for attributing his brother's remarks to him.

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plan central et la queue, etc., sont  
de type normal, et sont construits  
de manière à pouvoir recevoir des  
ailes de types différents, ainsi que  
des châssis et moteurs d'autres  
machines de la série, de manière  
à être appropriés à l'usage auquel  
la machine est destinée dans  
chaque cas particulier. Toutes les  
machines de cette série ont des  
ailes démontables et repliables et  
sont munies de notre dispositif  
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las máquinas de este tipo,  
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provistas del dispositivo patentado  
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# AERONAUTICAL ENGINEERING

## SUPPLEMENT TO "THE AEROPLANE"

INCORPORATING AIRCRAFT ENGINEERING, AERODYNAMICS, AIRCRAFT FINANCE AND COMMERCIAL AERONAUTICS AND MATTERS PERTAINING TO THE AERONAUTICAL ENGINEER AND THE AIRCRAFT TRADER.

### THE WEEKLY COMMENTARY.

The discussion on the papers read before the recent Air Conference is reported briefly below. No attempt has been made to comment upon the opinions expressed by the various speakers, because adequate discussion of all the points raised would require several volumes of this paper, and an inadequate treatment will not add to the value of the report of the views held by the particular persons who expressed them. Particularly interesting is the divergence of opinion between experienced designers as to the practical merits of all-metal construction in the present stage of development. This may be contrasted with the general agreement as to the certainty that eventually metal structures will become standard practice.

The report of the Accidents Investigation Committee on the disaster to the airship R.38 has now been issued to the Press.

The main features of this report are summarised in these pages. It will be found that the accident was the result of incomplete knowledge on the part of the designers as to the stresses involved in manœuvring any airship, and that disaster resulted from this ignorance because the ship was designed for a performance considerably outside of that of any ship for which there was any practical guide as to the structural strength required. The case is precisely analogous to that of the many early breakages of aeroplanes which resulted from lack of information as to the air loads which might be experienced in flight.

### TECHNICAL AFFAIRS AT THE AIR CONFERENCE—III.

#### THE DISCUSSIONS.

The discussion of all the papers read at the Conference took place on the second day, and as with the papers, the morning was theoretically reserved to the discussion of commercial matters. The greater part of the morning's proceedings have been dealt with in another portion of this paper, but certain matters of technical interest necessarily arose, and these are alone emphasised in the report of the morning's proceedings.

Lord WEIR, acting in place of the Secretary of State for Air, opened as he said by airing his own views before calling upon any other speaker. He said that State aid had during the last few years allowed numbers of miscellaneous aircraft to wander more or less irregularly over Europe, with very meagre results. Despite the meagreness of the results he saw no cause for pessimism as to the ultimate future. The cause of the poor results lay in the aeroplane itself, and the problem was one for the designers, who so far had never failed to produce what was required if they were given accurate and reliable data as to the improvements necessary. The operation of the London-Paris service gave such data, and was leading to steady improvement in technique.

Major-General Sir FREDERICK SYKES, as Controller-General of Civil Aviation, discoursed upon the policy of his Department in terms susceptible of varied interpretations. Taking the most charitable of these interpretations, however, it can scarcely be claimed that his Department has lived up to his principles. This discourse has been dealt with elsewhere.

#### INDUSTRY AND AVIATION.

Colonel ARMSTRONG, representing the Federation of British Industries, expressed the conviction that aviation can and will be of great commercial value. Mail and passenger carrying promised to be of the greatest use. The G.P.O. seemed less sympathetic to air mails than it might be. The London-Paris service was too limited to give a fair test of air services. Inter-Imperial routes—particularly the Egypt-India line—would be much more useful, and he believed they would pay.

General Sir SEFTON BRANCKER, representing the Air League of the British Empire, criticised the Department of Civil Aviation and many other things in a distinctly whole-hearted manner. He roundly asserted that the London-Paris service could be made to pay to-morrow, and that the Air Ministry were giving much larger subsidies than were necessary on this route.

#### THE POST OFFICE VIEW.

Brig-Gen. F. H. WILLIAMSON, Assistant Secretary to the Post Office, defended that Department against charges of indifference to the possibilities of Air Mail services. He pointed out that the London-Paris air-service offered no serious advantage over the night mail service. The K.L.M. service greatly expedited letters to Germany, but the public made little use of it. Five times the number of letters came from

Germany by air as went to Germany by that route. The Cairo-Baghdad Air Mail was the most useful, and it carried one-tenth of the whole mail to Baghdad. Regularity was absolutely essential for mail services in civilised countries, and although the regularity of the European air services had been excellent during the past summer, they were not satisfactory in the winter.

#### A PROTEST AGAINST "CRABBING."

Mr. F. HANDLEY PAGE, among other matters, deprecated the belittling of foreign progress in design. That progress might be along lines which did not meet British needs—but then conditions were different.

The remaining speakers during the morning did not raise any points of technical interest. During the afternoon, however, practically all the discussion was definitely technical, and it is dealt with here considerably more fully than the morning's proceedings.

Capt. G. DE HAVILLAND said that regarding safety from the structural point of view duplication was essential to avoid risk of flaws in material. Research into the heavy fuel problem was important on grounds both of safety from fire and of cost. Passenger comfort required careful attention. It was doubtful at present whether air sickness could be prevented entirely.

He believed it to be a fact that the single-engine machine was as reliable as the multiple-engined type, but it was a matter to be settled by practical experience.

He thought Major Green took an extreme view of the unreliability of wind-tunnel tests; his experience was that machines fulfilled predictions from such tests with good accuracy.

He found it difficult to discover any advantage in all-metal construction at the moment. There should almost certainly be a gradual evolution towards using more and more metal in aeroplane structure. But actually no one knew what was the life of a wooden machine. He believed it would be much greater than was generally supposed. There was room for research into the qualities and construction of plywood which would be very useful at the present time. He thought that while one could build wooden machines as light as, and at half the cost of, the metal machine, it was a mistake to call for metal structures.

The development of high-lift wings had been hampered by troubles of control, and those troubles were exaggerated by the fact that constructors had to hand over their new types to the Government for official test after only one or two flights. They should be given opportunities to try out such machines exhaustively for themselves.

#### TECHNICAL KNOWLEDGE IN HIGH PLACES.

Lt.-Col. MERVYN O'GORMAN drew attention to Capt. Guest's claim that the absence of technical qualifications was rather an advantage than otherwise for one holding an administrative

tive position such as his own (Capt. Guest's). He (Col. O'Gorman) dis-sented in the strongest possible manner from that view. It was deplorable that lack of technical qualification should be regarded as anything but a serious handicap to anyone in such a position. He pointed out that in the past great generals had always had a very thorough technical knowledge of the capacity of their men and their transport. Now, when mechanical appliances took the place of men's feet and horses' hoofs, it was just as important that administrative heads should have a technical knowledge of the capacities of these mechanical appliances. It was also important to provide a supply of technically trained pilots who would be able not merely to tell that a given aeroplane was good or bad, but how much better or worse it was than a given standard in all its essential qualities.

#### RESEARCH WORKERS ON RESEARCH.

Professor LEONARD BAIKSTONE thought that it would be better if Gen. Bagnall-Wild's Department was to be renamed the Technical Department. According to the account they had just had, only one fifth of its work was in the least research, and in these times of economy there was a serious risk of cutting out the research altogether and leaving only a Department of Research.

He thought everyone would agree with Major Green as to the importance of settling the divergences between model and full scale results, but there was some difference as to the urgency of settling this question. Direct comparisons between models and full size machines had been and still were being made. But he thought the problem would be really settled by the work of mathematicians at the Universities. The question had been under consideration for many years, and an answer from pure theory was certain to be more satisfactory than one based on limited experiment.

There was a lack of proper contact between research workers and designers and between designers and practical users of aircraft. All watertight compartments should be removed for aerodynamics was not yet sufficiently an established science for the use of routine methods. At present one would be surprised if a new machine showed a performance widely different from that predicted for it. But this had only been here for a short time and there were still a number of divergences and minor failures. This could be remedied if machines were not removed from the designers as soon as they were known to fly.

There were many machines on which much more knowledge was needed. One of these was the control and stability of aeroplanes at low speeds. Bad organisation was at present as serious a handicap to carrying on essential research as was lack of money.

Professor BUSTALL said that the co-operation of the Universities in aeronautical research was capable of adding greatly to our knowledge of aviation. Unfortunately the Universities themselves were in serious financial straits.

He personally was only competent to discuss engine research. It was clear that the ordinary carburettor had reached nearly the limit of its effectiveness. Fuel injection seemed the only alternative. Compressed air injection was the most effective method, but could not be used if one were limited to 25 lbs. per h.p. for the whole engine because of the weight of compressors, etc. Solid injection was used in stationary engines, but did not give such complete pulverisation of the fuel, and the method broke down at much lower speeds than did air injection.

If it was proposed to use this method he thought it would be essential to carry on fundamental research into the problem of pulverising fuels, rather than to make "ad hoc" experiments on an engine. He spoke with feeling as he had wasted months on such engine experiments without result.

#### LIP SERVICE—BUT NO HELP.

Sir RICHARD GLAZEBROOK said that for the last two days "Research" had been on everybody's lips. Yet only a few months back it seemed probable that all funds for the N.P.L. might be cut off. Facts showed that those in high places do not value research. All fundamental researches are difficult and cannot guarantee to provide definite results. Yet fundamental research alone was capable of revolutionising a given art; experimentation for specific ends produced only slow changes.

Investigations into the relation between model and full size tests were going on, and the present state of knowledge in that respect was in advance of that apparently possessed by Maj. Green.

The N.P.L. was fully occupied on a very important series of researches of a fundamental nature—embracing problems of stability, of the airscrew, and a series of international trials, together with some other work. They were greatly handicapped by shortage of staff and of money. Many problems connected mainly with materials were being attacked with the assistance of the Universities.

R.38.

There was much work on airships which might be done

and ought to be done. Referring to the R.38 disaster, could it be said that the loss of life which then occurred was a necessary payment for the advance of knowledge? It is now known that there was information available which would have cast grave doubts on the structural safety of that ship. Why was this knowledge not used?

Because the connecting link between the model and the full size was not available, and because it was not possible to design a safe ship with the performance of R.38 without further full scale research on airships. Sir Richard gave a detailed list of the attempts made to carry out full size tests on airships. None of these tests were completed as the ships were all put out of commission before the work could be completed. The first thing which would be necessary when we restarted airship work would be the building of a ship for experimental work.

#### METALLURGY V. THERMODYNAMICS.

Mr. A. E. L. CHORLTON suggested that in future the Conference should be divided up into sections to discuss specific branches of the subject. The present arrangement produced a *mélange* of pious hopes, propaganda, and technical discussion.

Maj. Green had referred to engine bearings and the assumption that the higher the speed of rubbing the lower the loading possible. This was the usual assumption, but the Mitchell bearing designer said that the higher the speed the more intense the loading might be. This paradox needed investigation.

He thought too much attention was being given to thermodynamic improvement of the aero engine. There was only another 10 per cent. to be gained in efficiency at the outside. Methods of construction leading to lower weights promised much more, and he thought metallurgy more important than thermodynamics.

The N.P.L. researches were very valuable but they did not go far enough, and to produce new materials of high grade with certainty the Director of Research should enlist the services of big industrial concerns.

#### ON COMBINING TECHNICAL AND PRACTICAL KNOWLEDGE.

Professor B. MEVILL JONES said that there was a great danger due to the gap between the technical and the flying personnel. During the War this had been overcome to some extent and the technical people got some flying experience. It was more difficult now. He suggested that a number of selected technically trained students from the Universities might be given one year's training in the R.A.F. and then pass to a small reserve force.

It was somewhat startling to find that although everybody agreed in praising the value of airships, it was nevertheless pronounced that airship work must cease.

To suggest that we can drop airship work now and take it up without loss in even two years' time is to assume either that the airship will stand still or that it is valueless.

Mr. J. D. NORTH said that he had attended the Conference to discover why the Aircraft Industry had come to its present state. The Secretary of State said that it was inevitable, but he learnt from General Branner that it was really due to administrative indigestion, and that only an adequate dose of ginger was needed.

He could not agree with previous speakers on the subject of metal structures. He had much experimental experience of metal structures and a metal machine could be built 10 per cent. lighter and little if at all more expensive than a wooden one. With metal a structure weight of 25 per cent. of the whole was possible, and this, together with other possible improvements, should help civil aviation to pay its way. But like all other transport systems aviation must be on a large scale to succeed.

#### THE NEED FOR GREATER PROGRESS.

Mr. H. P. FOLLAND said that it was somewhat surprising that after three years of civil aviation the aeroplane was still exactly the same as it was six years ago. Only one designer—Caproni—seemed to have broken away from traditional forms. For any large passenger carrying machine some such arrangement as that of the Caproni triple triplane was necessary to allow one to distribute the passengers. But development of this type was a large undertaking for a private enterprise.

Metal construction was of great promise, but it was complex and expensive. At the same time the warping of timber under severe climates was intolerable. He favoured a composite structure—steel for the main members with wood serving for the fairings.

He thought that to spend large sums on experimenting with a doubtful contrivance such as the helicopter was unwise. It would have been better to devote the amount to engine development.

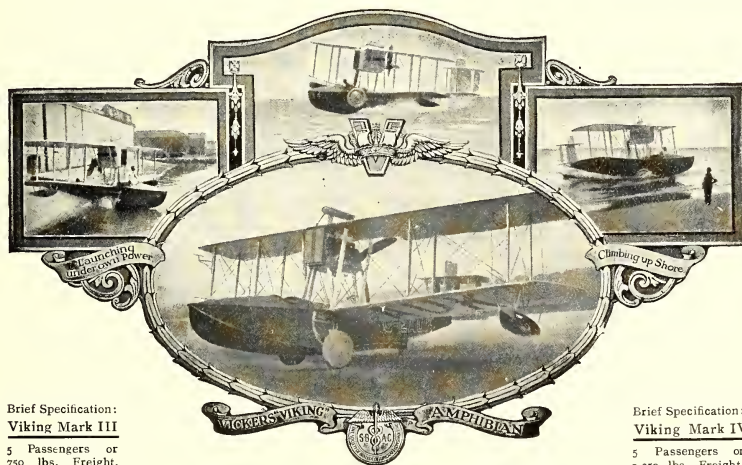
Apart from minor changes little had yet been done to improve commercial aeroplanes. British designers were handicapped because foreign constructors could build to lower fac-

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tors of safety than the British manufacturer, and some International agreement on this subject seemed desirable.

#### STATISTICS AND SAFETY.

Captain G. T. R. Hill said that he admired Col. Bristow's frankness in admitting that he charged 50 per cent. over first class fare for fourth class accommodation. Safety it seemed to him was of the very greatest importance. He had seen statistics showing that the passenger mortality on air lines was .0000 something of a passenger per mile. Such figures conveyed nothing to him, or to the world at large.

Actual figures showed that if travel by tube was as dangerous as travel by air, the London tubes would kill 500 people per day. The public thought this too dangerous, and he thought the public were right.

Steady but slow progress was being made. He thought that a properly arranged twin engine machine with separate power units each capable of flying the machine was the correct solution.

Major HILY POWELL, representing the Royal Colonial Institute, suggested that the trouble mentioned by the Director of Research as to supplies of suitable timber for aircraft could certainly be met by supplies from the British Dominions. Possibly it would be necessary to collect and test samples of available timbers from those Dominions and the services of the Royal Colonial Institute would willingly be given if such a scheme were undertaken.

Mr. F. HANDLEY PAGE mentioned the competition system adopted by the Royal Air Force for new types of aircraft. He thought a similar system was required for commercial machines—in order that transport companies might have a larger choice of types wherewith to work.

Improved reliability in aircraft was to be sought in im-

proved aeroplanes rather than in improved engines. The comparison with the motor car engine was fallacious—he had tried running motor car engines at full power on the road. Apart from expensive collisions with the police authorities he found that it led to rapid breakdown. When the aeroplane could fly with its engine developing 30 per cent. of its full power, the reliability of the motor car could be achieved.

Major Green had said that a solution of the problem of control at low speeds promised more than the development of high lift wings. This was an incomplete statement, for the high lift wing offered prospects of smaller and more robust aeroplanes. This line of improvement had greater promise than any of engine development.

Major-General SIR SEFTON BRANCKER said that stability was essential for fog and night flying. As the Director of Research said stability might be inherent or automatic—but he (Gen. Branker) was not so certain that inherent stability was sufficient. If he was correctly informed inherent stability meant that the machine went back to normal after being disturbed. Automatic stability meant that the mechanism prevented the disturbance. The difference might be important, commercially as to passengers comfort, and militarily as giving a steady gun platform, etc. The conditions in the Eastern tropics called for metal construction—wood could not long be tolerated there. For these districts it was necessary to develop a reliable air-cooled engine, and to remove indiarubber in all forms from the machine—in tyres and shock absorbers as well as petrol tubing.

He agreed with Professor Jones on the technical reserve—and he agreed with Capt. C. T. R. Hill as to the importance of safety. The latter's statistics made him feel very brave, but he did not believe those statistics any more than he did those given by the Controller-General of Civil Aviation.

## THE LOSS OF R.38.

The report of the Accidents Investigation Committee into the disaster to R.38 has now been published. The Committee consisted of the following gentlemen: Lt.-Col. Mervyn O'Gorman (chairman), Professor L. Bairstow, Wing (Cmdr. T. R. Cave-Brown-Cave, R.A.F., Mr. G. B. Cockburn, Mr. N. A. Doyle, Sir R. T. Glazebrook, Lt.-Col. E. Gold, S/Ldr. R. M. Hill, R.A.F., Sir G. H. Petavel, Major G. H. Scott, Dr. A. J. Sutton Pippard and Mr. H. B. Irving (secretary).

The report shows that in the design calculations for the structural strength of this ship, the aerodynamic forces which model tests showed to be possible were disregarded. Information on this subject at the time was small and there was an absence of corroborative evidence as to the applicability of the model results to full-size airships. The designers were not unaware of such information as existed and were alive to the importance of obtaining corroboration or contradiction of the model deductions at the earliest possible moment.

But they personally came to the conclusion that aerodynamic forces were relatively unimportant in the full size, although model tests indicated large bending moments due to air forces. This conclusion was based on experience with R.29 which was thought to show that the model tests were misleading. On the designers' assumptions, neglecting air forces, R.38 was as strong as R.35. The Committee conclude that allowing for the neglected forces R.38 had a factor of safety of about one-half of the earlier ship.

It appears to be clearly established that the ship had an insufficient margin of strength to withstand the stresses due to manoeuvres which might be necessary in normal flight, or be caused directly by bad weather. The ship was unstable and to overcome this new powerful and probably overbalanced control surfaces were fitted. The Committee record that (as long ago stated in this paper) on an early flight it was found that at 50 knots it was impossible to keep a steady height and that the ship "hunted" through 500 feet. This hunting led to failure of certain amidships girders at that time.

The Committee hold that the manoeuvres executed on the last flight were the result of legitimate use of the controls, and that therefore the failure is solely to be ascribed to inadequate strength. It is possible that the failure was gradual and that final breakage was due to the cumulative effect of a number of reversals of stress of a magnitude not far short of the failing stress of the structure.

Tests of samples of the structural material have been made, and it was found that a certain number of web plates from joints salvaged from the wreck were in a soft condition. The material responded to heat treatment, and it is probable that softening occurred during the construction of the ship. It is thought that the soft condition of these plates did not contribute to the accident, but their presence seems to indicate a certain lack of supervision during some part of the construction.

Deficiencies in the material used for radial wires were found and the Committee consider these to have been of unsuitable material. The character of the accident, however, was such that it cannot be ascribed to failure of this part of the structure.

When the ship was laid down by the Admiralty in time of urgent military necessity, every effort was made by the designers to comply with the very stringent specification imposed on them. When the work was taken over by the Air Ministry, although the military urgency had disappeared, no marked reduction of the requirements was made, although it now appears that these requirements were inconsistent with safety if the ship was driven at full speed at low altitude.

The conclusions of the Committee are tabulated as follows: That the accident was due to structural weakness in the design of the airship.

That during the final flights no loads were imposed in excess of those which might have occurred during the normal navigation of the ship in weather which might reasonably be encountered.

That having regard to her size and speed, R.38 was considerably weaker than previous British rigid airships.

That the provision of specially powerful control surfaces of new design virtually accentuated this weakness.

That during design no calculations were made of the stresses due to the aerodynamic forces to which the ship would be subjected.

That in consequence the calculations made by the design staff, taking specific account only of the forces and moments due to the distribution of weight and buoyancy, including gas pressures, were misleading.

That owing to the instability of the airship, the movements of the controls necessary to keep her on any particular course were large and rapid.

That the structure was not improbably weakened by the cumulative effect of reversals of stress of magnitude approaching the failing stress.

That in the construction of such an airship reference to first principles in design is necessary, and that for progressive development of airships in size and speed it was not sufficient to place exclusive reliance on a comparison with existing ships, using the routine methods adopted for R.38.

That the existing methods of calculation at present in use for determining the scantlings of structural members of an airship are insufficiently accurate for this purpose, and that more exact methods should be developed.

That research by both model and full-scale experiment is essential to determine and verify the forces to which an airship is subjected.

That the terms of the requirements laid down in time of war for R.38 were drastic and imposed too severe a task on the designers.

That when the design was originally laid down information as to aerodynamic forces existed which should have led to a detailed consideration of the effects of these forces and to consultation with the Advisory Committee for Aeronautics as to the dangerous loads foreshadowed by the model experiments on aerodynamic pressures then available.

That faulty material did not contribute to the accident. That, on the assumptions made, the structure was designed with great skill, and the necessary calculations were care-

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fully carried out by methods admitted as sufficiently accurate in other branches of engineering practice. That the weather at the time did not contribute to the accident.

The report briefly abstracted above emphasises in a most powerful manner the importance of continuing experimental work on airships in order that there may be absolutely no excuse for errors of so disastrous a character when the construction of airships is again taken in hand. It is also a very clear and definite indication of the vital importance of fundamental research work in aerodynamics.

It is well perhaps to consider what was the position of the designers of R.33. They were called upon, as the report shows, to build an airship to a very stringent performance specification which necessarily meant a very large saving in structural weight when compared to previous ships. There were model tests which indicated the possible existence of the aerodynamic forces which actually led to the loss of the ship. If these forces actually developed in flight, and adequate resistance to them in the structure was necessary, that structure would necessarily have had to be made heavier, making it impossible to comply with the specification.

On the other hand, the R.29, which had flown at the time when the design was laid down, showed no sign of the collapse which might have been expected if the model tests were reliable guides. This evidence was felt to be sufficient to justify the neglect of those model tests, particularly because it thereby became possible to comply at least fairly closely with the otherwise impossible specified performance.

In this case apparently the full-size experiments were in fact more misleading than the model ones. It is gathered that since that time further data tending to co-relate model figures to full-size facts has been acquired. It is beyond any doubt that there is not yet adequate knowledge available for accurate design purposes.

This is true not merely for the case of airships; it applies also to aeroplanes, and it is of the very first importance that every available effort should be made to establish as completely as possible a sound basis for the application of model figures to full-size aircraft of all types and sizes. Until this has been done the trials of any new type of airship or aeroplane must involve the risk of a disastrous accident due to forces which cannot with certainty be predicted in advance.

—W. H. S.

#### LT.-COL. MOORE-BRABAZON ON THE EARLY DAYS OF FLYING.

At a meeting of the Institution of Aeronautical Engineers, held at the rooms of the Society of Arts, on Thursday, Feb. 23rd, Lt.-Col. J. T. C. Moore-Brabazon, the President of the Institution for 1923, delivered a remarkably interesting lecture on his personal experiences in that stage of the history of flying which extended from 1903 to 1910.

It is impossible to give anything like a report of this lecture. It was delivered from notes, and was very much of an intimate and anecdotic narrative touching upon incidents within the speaker's own experience, and was illustrated by a series of lantern slides illustrating the events to which the speaker referred.

The lecture served to impress upon those members of the audience who have no experience of the difficulties with which earlier workers in applied aerodynamics had to contend the enormous amount of faith, patience, perseverance and courage which was called for in the early days, and it should serve to indicate to all workers in that field to-day the spirit wherein it behoves them to face the different but perhaps not less serious difficulties which they have yet to overcome.

The audience, unfortunately by no means so large as the interest of the lecture would have justified, was obviously held by the speaker throughout, and it was noticeable that among the more intensely interested listeners there were a number of survivors of the time, to which the speaker referred.

The lecture was followed by a number of added reminiscences of earlier days—it cannot be described as a discussion—recounted by the Chairman (Mr. Molesworth), Lt.-Col. F. McLean and Commander Harold Perrin and others.

The Institution is to be congratulated upon having inaugurated its new session with so extremely interesting and instructive a meeting.

#### THE INSTITUTION OF AERONAUTICAL ENGINEERS.

On Wednesday, Feb. 15th, a party of members of the Institution of Aeronautical Engineers paid a visit to the works of D. Napier and Sons Ltd. and saw the Napier "Lion" and "Cub" engines in process of manufacture.

The visitors were greatly struck by the excellent design and workmanship of the component parts, and particularly by the excellence of the crankcase castings, in which uniformity of thickness of walls and webs is achieved to a surprising degree.

The machining operations on cylinders were particularly interesting, and the very effective result, combining lightness and strength, was greatly admired. The care exercised in the viewing room and the high order of accuracy maintained in all components was also evident.

In the fitting shop, a "Cub" of 1,000 h.p. under erection was naturally the centre of interest, so much so that the numerous "Lions" in that department were almost neglected.

In the test shop a number of engines were seen on the bench. One of them, fitted with a gear drive for two air-screws to be mounted on the interplane struts of a machine, attracted much attention. The complete unit was extremely compact and light, and the gears ran surprisingly quietly and smoothly.

The packing shop, from which engines issue to the customer, was the last department visited. Members were greatly impressed by the large amount of aero-engine work in hand, and formed the opinion that the slump in aviation business must be reaching its end.

#### LLOYD'S AND AVIATION.

Those who are closely concerned with Commercial Aviation would do well to make a practice of reading *Lloyd's List*, which is published daily at the price of 4d. That wonderful organisation which is known as Lloyd's is becoming closely concerned with Civil Aviation and will certainly become more so when the present Department of Civil Aviation is abolished or is reorganised under more capable control.

Meantime, *Lloyd's List*, which is the official organ of Lloyd's so to speak, is now publishing every Monday some three columns of very sound matter concerning aviation, generally written from the business man's point of view, and in such a manner as to cause interest among those who are not as yet directly concerned with aviation. Apart from this, any special incidents such as the recent Air Conference are treated fully in the *List* and if anything of an apparently interesting nature occurs in aviation it is recorded whatever the day of the week. Furthermore, any papers of aeronautical interest such as those read before the technical associations concerned with aeronautics received attention to the extent of a column or even more.

Altogether it is a very healthy sign to see a body such as Lloyd's taking so vivid an interest in a business which is being so badly mismanaged as is Civil Aviation. It shows that those who are really the leaders of the British business community have considerably more sense than is commonly credited to them.

#### A NEW COMPANY.

R.A.F.C. Co. Ltd. (179,795).—Private company. Registered Feb. 18th. Capital £1,000 in £1 shares. To hold premises acquired by nominees on behalf of the company and intended to be occupied by the Royal Air Force Club at 128, Piccadilly, and 6, Park Lane, W. The first directors are: A. Colls, Heatherbate, Harpenden, Herts; J. L. Walsh, 81, Prince of Wales Mansions, Battersea Park, S.W.11; W. J. H. Harcourt, 14, St. Simon's Avenue, Putney, S.W.15. Registered Office: 128, Piccadilly, W.



A NEW JAPANESE AEROPLANE.—The Japan No. 1, built by the Mitsubishi Dockyard Co. to the designs of English Engineers on their staff. The machine is a single-seat fighter with a 500-h.p. Japanese-built Hispano-Suiza, and has a distinctly high performance.



## AN APPRECIATION OF THE DH9c.

The following is an extract from a letter recently received from the Compañía Española de Tráfico Aéreo—the Spanish aerial transport company which is running the Seville-Larache Air Line:—

“On the occasion of the completion of the first three months during which we have been operating the first Spanish air service between Sevilla and Larache, we should like to take the opportunity to place on record our satisfaction with the material and personnel provided by you. Using these exclusively, you will be pleased to hear that we have, since the inauguration of our service on October 15th, 1921, till January 15th, 1922, successfully completed 85 return journeys. This represents 42,500 kilometres covered without difficulty or mishap and an incalculable saving in time and increase in regularity over the existing means of transport.”

The above company is using DH9c machines exclusively supplied by:

**The De Havilland Aircraft Co., Ltd.,**  
**Stag Lane Aerodrome, Edgware, Middlesex, England.**

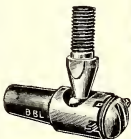
### Aircraft Equipment



Standard Pins A.G.S. 167.  
Any size or quantity supplied within seven days.

Our complete stocks of Aircraft and Aerodrome Equipment Accessories enable us to meet the requirements of Constructors, and give quick delivery.

A.G.S. 385. BALL JOINTS.  $\frac{3}{4}$  B.S.F. Material to specification No. S.1. or S.21. Socket, over a length 1-4 inches; ball, diam. of spherical end, 37 inches; plug, screw thread 7/16 B.S.F.; split pin, 1/16 by  $\frac{3}{4}$  inches.—From stock.



Write for our up-to-date priced list of A.G.S. Bolts and Nuts, from A.G.S. 101 to A.G.S. 112.

A bad landing generally means damaged instruments. Send these along to us for repair. We will overhaul and put them in perfect order to satisfy Government requirements, at minimum charges.



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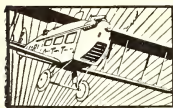
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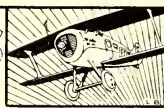
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 BRIGHT STEEL

We shall be pleased to quote for special parts turned from the bar. Send your inquiry direct to us, and it shall have our prompt attention.



# COMMERCIAL AERONAUTICS

## AND CIVIL AERIAL TRANSPORT.



### THE UNITED KINGDOM OF GREAT BRITAIN AND IRELAND.

#### CONTINENTAL ARRIVALS AND DEPARTURES.

[The following table of arrivals at and departures from the British Air Ports is compiled on the following system:—First comes the initials of the Air Line; next the type of machine; next the international number of the machine; next the ports of departure and destination; next the times of departure and arrival; next the cargo, whether goods (G) and/or mails (M); next the number of passengers; and finally the name of the pilot and number of mechanics, if any.]

ABBREVIATIONS:—A.D.—Aircraft Disposal Co. B.A.—Berkshire Aviation Co. B.C.—Bristol Aeroplane Co. B.M.—Brompton Motor Co. C.A.—Department of Civil Aviation. D.H.—De Havilland Aircraft Co. G.E.—Compagnie des Grands Express Aériens. H.P.—Handley Page Transport Ltd. I.L.—Instone Air Line. K.L.—Königlich-Lichtvaart Maatschappij. L.A.—Leatherhead Aviation Services. M.A.—Messageries Aériennes. M.W.—Marconi Wireless Telegraph Co. Ltd. P.O.—Privately owned. P.L.—Peters Ltd. S.F.—Surrey Flying Services. S.N.—Syndicat National pour l'Etude des Transports Aériens (S.N.E.T.A.).

#### The London Terminal Aerodrome, Croydon. (Telephone: Croydon 2720.)

##### FEBRUARY 20th:

I.L., DH.8, G-EAWO, London-Paris, 10.10-12.20, Nil, Nil, Powell & 1.  
H.P., DH.4, G-EAWH, London-Paris, 12.13-14.57, G.M., 1, Wilcockson.  
I.L., DH.8, G-EAWW, London-Paris, 12.19-14.30, G.M., 3, Holmes & 1.  
G.E., Goliath, F-GEAO, London-Paris, 12.24-14.45, G., 2, Mire & 1.  
M.A., Spad, F-ACMI, London, Paris, 12.35-15.10, G., 1, Donelin.  
M.A., Spad, F-ACME, London-Paris, 13.14-15.30, Nil, Nil, Briere.  
A.D., DH.9, G-EBAK, London-Brussels, 15.20-16.35, Nil, Nil, Stocken.  
H.P., HP, G-EATH, Paris-London, 11.00-14.45, G., 4, McIntosh & 1.  
G.E., Goliath, F-ADDS, Paris-London, 11.30-15.30, G., 3, Labouchere & 1.  
M.A., Spad, F-ACMA, Paris-London, 12.56-15.35, G.M., Nil, Delage.  
I.L., DH.8, G-EAWO, Paris-London, 13.25-16.10, Nil, Nil, Powell & 1.

##### FEBRUARY 21st:

H.P., HP, G-EATH, London-Paris, 12.17-15.24, G.M., 6, Olley & 1.  
I.L., DH.8, G-EARO, London-Paris, 12.20-15.00, G.M., 2, Courtney & 1.  
M.A., Spad, F-ACMA, London-Paris, 12.22-14.35, G., Nil, Delage.  
G.E., Goliath, F-ADDS, Paris-London, 12.25-15.00, G., Nil, Labouchere.  
H.P., DH.4, G-EAWH, Paris-London, 10.35-15.08, G., 1, Wilcockson.  
M.A., Goliath, F-ADCA, Paris-London, 12.35-16.10, G.M., 1, Le Men & 1.  
G.E., Goliath, F-GRAC, Paris-London, 13.10-16.25, Nil, 4, Gastoux & 1.

##### FEBRUARY 22nd:

G.E., Goliath, F-GEAC, London-Paris, 11.58-15.40, G., Nil, Gastaux & 1.  
H.P., DH.4, G-EAWH, London-Paris, 12.20-14.35, G., Nil, Wilcockson.  
I.L., DH.8, G-EAWO, London-Paris, 12.18-14.55, G.M., Nil, Robins & 1.  
H.P., HP, G-EATH, Paris-London, 12.00-15.24, G., 1, Olley & 1.  
G.E., Goliath, F-ADDT, Paris-London, 11.50-14.55, G., 4, Mire & 1.  
I.L., DH.8, G-EAWW, Paris-London, 12.05-14.54, G., Nil, Holmes & 1.  
I.L., DH.8, G-EARO, Paris-London, 13.16-16.12, Nil, Nil, Courtney & 1.  
M.A., Spad, F-ACMG, Paris-London, 13.15-16.10, G.M., 2, Chailoux.

##### FEBRUARY 23rd:

I.L., Vimy, G-EASI, London-Paris, 12.16-12.57/24th, G.M., 5, Powell & 1.  
H.P., DH.4, G-EAWH, Paris-London, 11.00-13.55, G., Nil, Wilcockson.  
I.L., DH.8, G-EAWO, Paris-London, 12.20-15.00, G., 3, Robins & 1.

##### FEBRUARY 24th:

I.L., DH.8, G-EAWW, London-Paris, 12.10-14.51, G.M., 4, Holmes & 1.  
H.P., HP, G-EATH, London-Paris, 12.26-15.23, G.M., 2, McIntosh & 1.  
G.E., Goliath, F-GEAD, Paris-London, 11.56-16.24, G., 5, Chalmers & 1.  
I.L., Vimy, G-EASI, Paris-London, 13.12-16.05, G., 5, Powell & 1.  
M.A., Breguet, F-CMAJ, Paris-London, 13.16-16.15, G.M., 1, Le Sec.

##### FEBRUARY 25th:

G.E., Goliath, F-ADDT, London-Paris, 12.00-15.30, G., 2, Mire & 1.  
H.P., Bristol, G-EAWW, London-Paris, 12.22-15.30, G.M., 5, Olley & 1.

#### The London Terminal Aerodrome.

##### THE AIRCRAFT DISPOSAL CO.

On Monday Mr. Herne was out twice testing a D.H.9. Mr. Stocken the same day took another D.H.9 to Brussels in eighty-eight minutes. He crossed the Channel from Folkestone Harbour to Calais Harbour in exactly ten minutes.

On Wednesday a number of Greek Naval and Military officials visited the A.D.C. and were given demonstrations on various machines. Mr. Muir flew an Avro and S.E.5a, Mr. Carter flew a D.H.9a and a Bristol, and Mr. Stocken took the air on a Martinsyde 4.

[One gathers that their demonstrations would have been much more effective if they had not flown directly over the heads of the spectators, who being thus forced to look vertically upwards into a blazing sun were quite unable to follow the evolutions which looked quite well when viewed from one side. Pilots really ought to learn to fly "down-sun" from the spectators.—C. G. G.]

On Friday Mr. Stocken had a Bristol for test, which machine Mr. Piercy took to Brussels the next day. During the test with Mr. Basil Curtiss as passenger an oil pipe broke which gave him a little oil bath all to himself. It seems that in future he will be known at the Disposal Company as "Saubee."

Later on he started to Brussels on a D.H.9, but an oil pump stuck so he returned and got away again all right on the Saturday morning.

##### GENERAL FLYING.

Handley Page Transport Ltd. is the first of the air lines to get a new machine running on the service. On Saturday

M.A., Breguet, F-CMAJ, London-Paris, 12.37-16.25, Nil, Nil, Le Sec.  
A.D., DH.9, G-EBAK, London-Brussels, 11.53-13.43, Nil, Nil, Stocken.  
I.L., DH.8, G-EARO, London-Paris, 12.40-16.10, G.M., 4, Robins & 1.  
G.E., Goliath, F-GEAO, Paris-London, 11.40-14.06, G., 1, Courtney & 1.  
I.L., DH.8, G-EAWW, Paris-London, 11.57-14.05, G., 5, Holmes & 1.  
M.A., Breguet, F-CMAJ, Paris-London, 13.08-15.34, G.M., Nil, Perignon.  
K.L., Fokker, H-NABC, A'dam-London, 13.50-10.30/26th, Nil, 2, Duke.

##### FEBRUARY 26th:

I.L., DH.8, G-EAWO, London-Paris, 13.54-17.16, Nil, 2, Powell & 1.  
I.L., DH.8, G-EARO, Paris-London, 12.00-14.35, Nil, 7, Robins & 1.

#### Inland Flying at Croydon.

Feb. 26th.—I.L., D.H.4, Brooklands return (Barnard); Vimy from Brooklands (Robins); S.F., Avro, Jovides (Muir).  
Feb. 28th.—H.P., Bristol, tests (all H.P. Pilots).  
Feb. 28th.—H.P., Bristol, test (McIntosh); M.A., Goliath, test (Le Men); S.F., Avro, Jovide (Muir).  
Feb. 29th.—S.F., Avro test (Muir); I.L., D.H.18, test (Barnard).  
Feb. 24th.—Nil.  
Feb. 25th.—D.H., DH.9, Stag Lane return (Broad); I.L., D.H.18 and D.H.4 tests (Barnard); S.F., Avro, Jovides (Muir).  
Feb. 26th.—Nil.

#### Flying by The Aircraft Disposal Co.

Feb. 26th.—D.H.9, G-EBAK, two tests (Horne).  
Feb. 28th.—S.E.3, G-EAXU, demonstration (Muir); Avro, G-EAIX, demonstration (Muir); Bristol Fighter, G-EASH, demonstration (Carter); D.H.9a, demonstration (Carter); Martinsyde F.4, G-EAXB, demonstration (Stocken).  
Feb. 29th.—Nil.  
Feb. 24th.—Bristol Fighter, G-EBAM, test (Stocken); D.H.9, G-EBAK, test (Stocken).  
Feb. 25th.—Bristol Fighter, G-EBAM, left for Brussels (Piercy); D.H.9, G-EBAK, left for Brussels (Stocken).

#### Cross-Channel Statistics.

Week ending February 26th:—  
Machines, 48; Passengers, 81; Crews, 74; Total Personnel, 155  
Corresponding week last year:—  
Machines, 30; Passengers, 32; Crews, 38; Total Personnel, 70

Mr. Olley took the Napier Bristol to Paris with six passengers and a load of goods. There was a stiff wind blowing against him but he made the journey in good time. The new Rolls-Royce engine W.8bs are coming along well.

The installation of the Jupiter engines on the O/400 is being altered and further tests will then take place.

Earlier in the week the D.H.4a and the Rolls-Royce O/400 have been keeping up the service.

Mr. Barnard was testing a D.H.18 for the I.A.L. on Thursday, doing various steep banks and stalls. Another machine was being tested by him on Saturday morning prior to going to Paris. When in the air a curious whistling sound started up suddenly which could be heard plainly from the ground. On landing, the pilot attributed this to roughness of the engine. It was found, however, that the fabric had unstuck on one blade-tip of the airscrew. This had to be hurriedly changed as the passengers were waiting to get off to Paris.

It so happened that the line had not got a suitable airscrew in store at the time so they approached Major Greer who allowed them to use the airscrew which was on the new D.H.18 which was delivered last week to the Department of Civil Aviation. This was duly fitted and the machine got away in due course.

By the time these notes appear, Mr. Robins will have been married at South Farnborough. Everybody will wish him and Mrs. Robins the very best of luck.

The new offices for the Daimler Hire line are in course of construction opposite the I.A.L. office.

It is said that the D.H.34s to be used by this line are to

be painted pillar-box red. It is rumoured that the controllers of this air line are in league with the Brighton London people. The service will probably begin about April 27th. Mr. Hinchliffe will be chief pilot and other pilots mentioned in connection with the line are Messrs. Reeve, Iradley, Duke and Shepperson, all of whom will be remembered as pilots to the late A.T. and T.

Mr. Duke was expected on Saturday from Amsterdam on a Fokker with two passengers who had booked the machine as a special. He left Amsterdam at 14.00 hours and had a gale against him all down the North Sea. It took him nearly four hours to reach the English coast so he decided to visit Lynnhpe, which aerodrome he had not then seen for quite a while. It must almost have seemed like returning home.

He restarted on Sunday morning and after landing at Croydon and decanting his passengers the machine was blown over and damaged.

On Saturday morning Mr. H. S. Broad, who flew his "Camel" in the Aerial Derby, and who is now a regular pilot to the De Havilland Aircraft Co., came in on a D.H.9 and left again soon after lunch.

Further petrol tests have given further remarkable results. This time a Rolls-Royce engine belonging to Handley Page Transport. The tanks were filled with one kind of spirit and, using two radiators, the engine speedily boiled. Using "Aviation" spirit of the same brand, however, the engine performed quite satisfactorily. Mr. Shaw then came along and filled the tanks with Shell "Aviation" spirit. He only got twenty more "revs." than the other but the temperature was eleven degrees lower.

Mr. Wigglesworth is keeping his R.A.F.-engine S.E.5a at the aerodrome for a month. He intends to fit up half a dozen similar machines and wants to sell them for £100 each.—G. D.

### Wantage.

Mr. Fred Holmes and the staff of the Berkshire Aviation Tours are now back at G.H.O., East Hanney, where they are executing repairs on the Avro G-EASF on which Mr. Ferrand recently had a mishap.

They are now preparing for their programme for the coming season.

### THE END OF MR. COBHAM'S TOUR.

News is to hand giving details of Mr. Alan Cobham's *amerisage* on Feb. 18th. He was approaching the aerodrome at Venice in foggy weather when, as he was about to turn

into the aerodrome a sudden mist and fog fell right on him and blotted everything out. Knowing from previous experience the obstructions there, also the number of ships, piles, and buoys about the waters of the Lido, he decided it would be dangerous to go on.

The rain and mist were blinding and so Mr. Cobham decided to come down where he was, 100 yards from the shore. He felt his way down onto the water and the machine floated successfully. Mr. Sharpe, the passenger, at once jumped up and shook hands, complimenting Mr. Cobham on the achievement.

They then proceeded to get the baggage up on the centre section and by the time a boat arrived the machine was beginning to sink. They all got into the boat and reached the shore in safety.

The De Havilland Aircraft Co. to whom the machine belonged on hearing the news at once offered to send a new machine to complete the tour, but Mr. Sharpe decided to go on with Mr. Cobham to St. Moritz by ground and to complete the air journey later after a few runs on the Cresta.

Mr. Cobham points out that the mishap is in no way an "aviation accident" but was merely a "safety first" precaution.

## PERSONAL NOTICES.

### ENGAGEMENTS.

**DASHWOOD-BURRARD.**—The engagement is announced between Sidney L. Dashwood, M.B.E. (late Capt. R.A.F.), youngest son of the late Rev. R. L. and Mrs. Dashwood, of The Mount, Yarmouth, I. of W. and Joan, only daughter of Colonel Sir Sidney Burrard, K.C.S.I., F.R.S., and Lady Burrard, Foxhill, Farnborough, Hants.

**GREENSMITH-CRAVEN.**—The engagement is announced in Shanghai between Reginald E. Greensmith (late R.A.F.), son of Mr. and Mrs. Greensmith, of 135, Sloane Street, S.W.1, and Lucy, youngest daughter of Mr. and Mrs. Craven, of Shanghai.

### MARRIAGES.

**COX-HALL-BROWN.**—On Feb. 22nd, at the Church of St. John Baptist, Bishops Teignion, by the Rev. W. E. Cox, F.O. Denys Arthur Cox, seventh son of the Rev. and Mrs. Cox., of Bishops Teignion, to Jane Dorothea, elder daughter of the late Major J. Hall Brown, of Ceylon, and Mrs. Hall Brown, of Bishops Teignion.

**PASSMAN-JONES.**—On Feb. 27th, Capt. D. C. Passman, late R.A.F., to Madeline Kendal Jones, late W.R.A.F.

### BIRTHS.

**MORTIMER.**—On 11th inst., at 124, Church Road, Moseley, Birmingham, the wife of George Mortimer, late R.A.F., of a son.

**NOEL.**—On Feb. 17th, at Laverock, Searfirth, near Liverpool, to Edith (nee Gairdner), the wife of Captain M. W. Noel, A.F.C.—a son.

## TUBING FOR AIRCRAFT.



WELDLESS steel tubing in carbon steels, nickel steels, and chrome nickel steels to all official Government specifications. Further to the actual manufacture of the tubing, all manner of manipulating is carried out, such as reducing, expanding, tapering, bending, flanging, brazing, welding, etc., etc.

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Per 105/- Dozen.



## THE BUYERS' GUIDE WEEK BY WEEK.

## AEROPLANE MANUFACTURERS.

	See Advertiser's Page
Bristol Aeroplane Co., Ltd., The, Filton House, Bristol. "Aviation," Filton. Bristol 3906. Back Cover	
De Havilland Aircraft Co., Ltd., The, Stag Lane Aerodrome, Edgware. "Haviland," Edgware. Kingsbury 160-1, 2 lines 161	
Fairley Aviation Co., Ltd., The, Hayes, Middlesex. "Airily," Hayes, Middlesex. Hayes, Middlesex 19. Front Cover & 153	
Roe, A. V., & Co., Ltd., Newton Heath, Manchester. "Triplane," Manchester. City 8530-1, Manchester. Inside Front Cover	
Vickers, Ltd., Vickers House, Broadway, London, S.W.1. "Vickers," Vic. London. Victoria 6900. 157	

## AIRCRAFT DISPOSAL.

Aircraft Disposal Co., Ltd., The, Regent House, Kingsway, London, W.C.2. "Airdisco," Phone, London. Regent 6240 (5 lines) Back Cover	
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## CORDS, THREADS, TAPES AND WEBBING.

MacLennan, John, & Co., 115, Newgate Street, London, E.C.1. "Vanduaar," Cent, London. City 3575	
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## DOPE.

Titanine, Ltd., Empire House, 175, Piccadilly, London, W.1. "Tetrafree," Piccy, London. Gerrard 2312, Regent 4720. 159	
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## ENGINES.

Bristol Aeroplane Co., Ltd., The, Filton House, Bristol. "Aviation," Filton. Bristol 3906. Back Cover	
Rolls-Royce, Ltd., 15, Conduit Street, London, W.1. "Rollhead," Reg, London. Gerrard 1654 (6 lines) 154	

## FLOTATION AIR BAGS.

R.F.D. Company, 21, Queen's Road, Hershman, Surrey. Fisher 365. 164

## INSURANCE.

Bray, Gibb & Co., Ltd., 166, Piccadilly, London, W.1. Regent 4726. Front Cover	
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## METAL PARTS AND FITTINGS.

Brown Bros., Ltd., Great Eastern Street, London, E.C.2. "Imbrowned," Bethnalton, London. London Walk 6300 (14 lines). 161	
Rubery, Owen & Co., Darlington, South Staffs. "Roofs," Darlington. Darlington 87 (3 lines) 161	

## STEEL TUBING.

Accles & Pollock, Ltd., Oldbury, Birmingham. "Accles," Oldbury. Oldbury 111. 163	
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## TEST PILOTS.

Tait-Cox & James, c/o S. Heckstall Smith, F.R.Ae.S., 4, Golden Square, London, W.1. Gerrard 3480. 164	
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## TYRES AND WHEELS.

Palmer Tyre, Ltd., The, 119, 121, 123, Shaftesbury Avenue, London, W.C.2. "Tyreord," Westcent, London. Gerrard 1214 (5 lines) 163	
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## WINE MERCHANTS.

Godfree, E., & Co., 119, Regent Street, London, S.W.1. "Egges," Piccy, London. Gerrard 5712. 163	
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## SITUATION WANTED.

PILOT, licence "B" Bristol Fighter and Avro, would welcome JOB OF WORK next week, cross-country or joy-riding. Please write immediately.—Coles, 4, Park Road, Rugby.

## PATENTS.

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THE PROPRIETOR OF BRITISH PATENT No. 121365, dated February 28th, 1917, relating to "Aeroplane," is desirous of entering into arrangements by way of a licence or otherwise on reasonable terms for the purpose of exploiting the above Patent and ensuring its practical working in Great Britain. All inquiries to be addressed to B. Singer, Steger Building, Chicago, Illinois.

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FOR SALE—Avro type 3-seater Seaplane fitted with E.A.C. Flotation gear and 3-h.p. Clerget Engine. Convertible to land machine. Total flying hours 25. Certificated for airworthiness. Conditon as new. £370.—Eastbourne Aviation Co., Ltd., Eastbourne.

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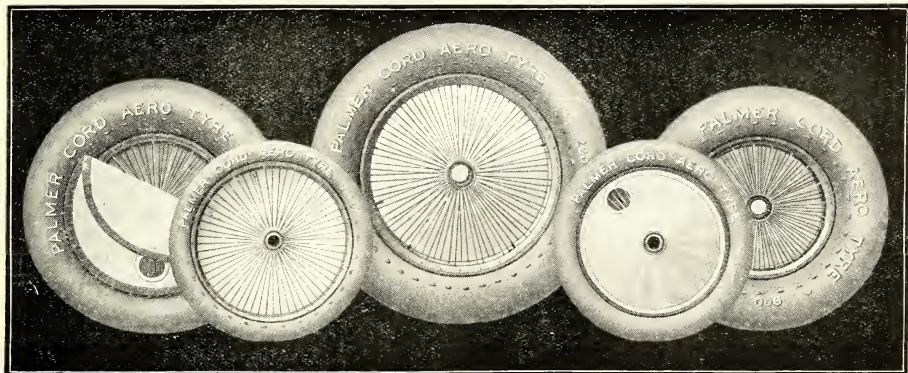
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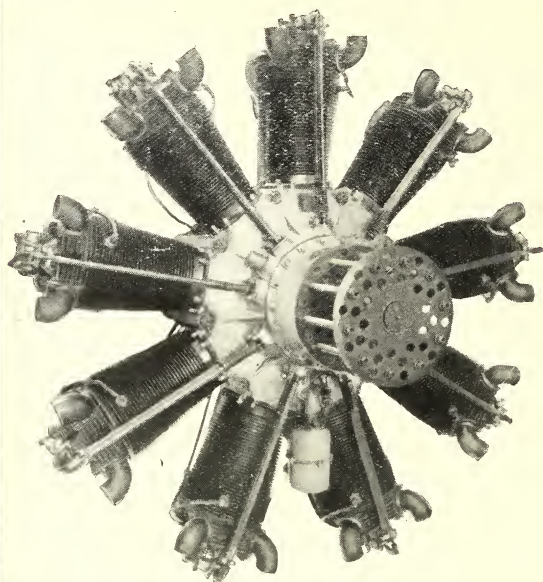
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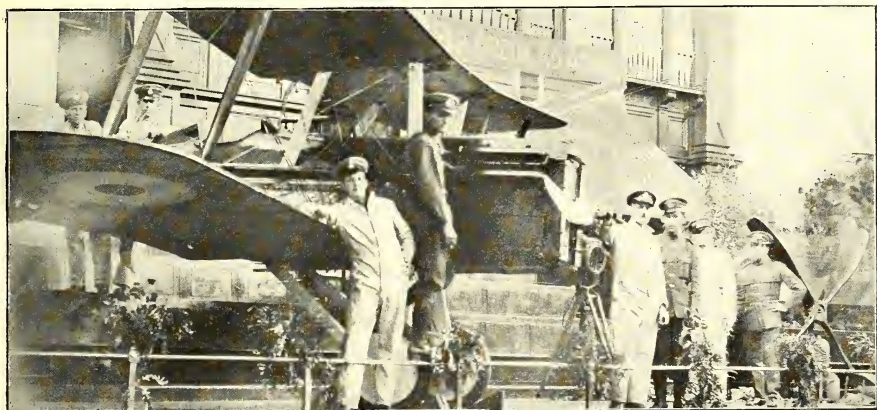
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SIXPENCE WEEKLY.

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## ON EVENTS OF THE WEEK.

So many things of importance on the historical side of aviation have happened during the past week that it is impossible to find space as one had hoped for a thorough discussion of the Geddes Report in its relation to aviation. It seems therefore that the said Report must be relegated to that vast heap of subjects on which one would like to argue but cannot owing to sheer lack of space. In any case, as the Government seems disposed to treat the Ave with considerably less respect than Damocles treated his sword, perhaps it would be after all a work of supererogation to devote time and space to the work of the great Geddes. Therefore one may turn with a clearer conscience to the events of the week.

### THE CIVIL AVIATION ADVISORY BOARD.

The first subject of moment is obviously the appointment of the Civil Aviation Advisory Board. Its importance is due rather to the fact that it is an official act of the Air Ministry than to any hope that the said Advisory Board will ever do anything which will seriously affect the History of British Civil Aviation.

Like the Air Conference itself, this Advisory Board is composed too largely of the Big Bugs of aviation to have the practical effect which it might have had if it had included some of the Little Bugs who have a more intimate knowledge of what is really happening and what is really wanted in Civil Aviation. As Mr. Kipling has said:—

"The toad beneath the harrow knows,"  
Exactly where each tooth-point goes,"

and one can scarcely expect the august gentlemen who compose the Board to have very much knowledge of or sympathy with the feeling of the mere toads of aviation. Their outlook is bound to be far too Olympian. (This remark has no reference to the possibility of further aero-shows at inopportune times of the year, despite the presence on the Board of one prominent member of the motor trade and another prominent member of the aircraft trade.)

Air Ministry Communiqué No. 757 announces the constitution of the Board as follows:—

The Civil Aviation Advisory Board, the creation of which was announced by the Under Secretary of State for Air at the recent Air Conference, has now been set up with the following terms of reference:—

"To advise generally on the development of Civil Aviation and to report upon any specific point which may, from time to time, be referred to the Board by the Secretary of State for Air."

The constitution of the Board is as follows:—

The Under Secretary of State for Air (The Rt. Hon. Lord Gorell, C.B.E., M.C.), Chairman.

The Controller-General of Civil Aviation, Air Ministry (Major-General Sir Frederick H. Sykes, C.B.E., K.C.B., C.M.G.)

The Director-General of Supply and Research, Air Ministry (Air Vice-Marshal Sir W. G. H. Salmond, K.C.M.G., C.B., D.S.O.)

Representatives of:—

General Post Office (Brigadier-General F. H. Williamson, C.B.E.).

Air League of the British Empire (Major-General Sir W. Sefton Brancfer, K.C.B., A.F.C.).

Association of British Chambers of Commerce (Mr. Edward Manville, M.P.).

Federation of British Industries (Mr. H. James Yates).

Lloyd's (Lieut.-Colonel Sir Frederick Hall, K.B.E., D.S.O., M.P.).

Royal Aero Club (Brigadier-General Sir Capel Holden, K.C.B., F.R.S.).

Royal Aeronautical Society (Lieut.-Colonel Mervyn O'Gorman, C.B.).

Society of British Aircraft Constructors, Limited (Sir Henry White Smith, C.B.E.).

Mr. F. G. L. Bertram, C.B.E. (Secretary), Air Ministry.

Arrangements have also been made for consultation, when required, with representatives of the Dominions.

The Secretary of State has decided to refer to the Advisory Board, as the first subject upon which he desires its recommendations, the question of the cost and practicability of an Imperial Air Mail Service.

The Advisory Board is holding its first meeting on Thursday afternoon, March 2nd.

### The Members of the Board.

It is of course quite right and proper that Lord Gorell should be Chairman of the Board. But one is convinced that the Controller-General of Civil Aviation should not be a member. The Board has been set up to advise on the development of Civil Aviation. Obviously, therefore, the Controller-General of Civil Aviation is one of the persons to be advised by the Board and not one of those who should participate in giving advice to the authorities. One holds this view quite irrespective of the particular personality who may be Controller-General of Civil Aviation at any one particular time.

So far as the present C.G.C.A. is concerned one is inclined to think that Sir Frederick Sykes, with his undoubted foresight and experience of aviation, may make quite a good member of an advisory board. In fact one believes that he would be very much more valuable in an advisory capacity such as this than he has proved himself to be in his present executive capacity. In fact, the almost complete failure of the Department of Civil Aviation under his control and the number of things which have been left undone that ought to have been done by his Department will cause many people to hope that if he is to continue his connection with Civil Aviation at all it may be in future in an advisory and not in an executive capacity.

Similarly, one doubts whether the Director-General of Supply and Research ought to be a member of an advisory board. Naturally, questions of supply and research affect the development of Civil Aviation. Moreover, as one has already pointed out, such progress as has been made in the design and production of civil aircraft has been due in the past entirely to the Department of Supply and Research, and not to the Department of Civil Aviation as it ought to have been. At the same time, surely the Director-General of Supply and Research is another of the persons who ought to be advised by this Civil Aviation Advisory Board and ought not to be one of those who do the advising. At any rate, there is the satisfaction of knowing that Sir Geoffrey Salmond is a man whose advice is always worth having on anything connected with the subject of practical flying.

There is perhaps a little more excuse for appointing a representative of the General Post Office to the Board, because where questions of air mails have to be discussed air mail enthusiasts on the Board will themselves need to be advised by somebody who has practical knowledge of Post Office work. And presumably the presence of General Williamson on the Board will not prevent the Board from giving good advice to the General Post Office.

General Brancfer's appointment is obviously right. Few people have had more personal knowledge of practical aviation in all its phases. He has a knowledge of staff work which ought to be uncommonly useful in ordering the procedure of the Board. And his enthusiasm for aviation is absolutely undebatable.

Why Mr. Edward Manville was appointed is something of a mystery. Probably it is a good thing that the Association of British Chambers of Commerce should take an interest in aviation, but one cannot quite see how such a body by way of its representative can give any practical advice to the Air Council on the subject of Civil Aviation. Mr. Manville has long been associated with the Society of Motor Manufacturers and Traders, which body has been associated with aviation as the organisers of the various aero shows at Olympia, and certainly there has been nothing in the organisation of those shows to inspire a hope that anybody connected with the S.M.M. and T. can be of any assistance to Civil Aviation.

One believes, however, that Mr. Manville is still a director of the Daimler-B.S.A. group, in which case it may be permissible to assume that he is interested in the Daimler Hire Company which is about to start an air line between



London and Paris under the management of Colonel Searle and Major Woods Humphrey. If either of these gentlemen had been appointed to the Board they could undoubtedly have given valuable advice on air line organisation and so forth, but one cannot recall that Mr. Manville himself has hitherto displayed any active interest in aviation, unless he was a member of the board which decided to close down A.T. and T. Ltd., and to cease making aeroplanes at the Aircraft Manufacturing Co. Ltd.

As regards Mr. James Yates, it is undoubtedly a good thing to have the Federation of British Industries interested in Civil Aviation, but one cannot recall that Mr. Yates has had anything to do with flying or that his Federation has taken any interest in the subject up to the present. Therefore it is difficult to understand how he can advise on the subject of Civil Aviation.

Lloyd's should naturally be represented on such a Board, because of the vast importance of insurance to the success of Civil Aviation, but here undoubtedly is a case where some lesser light with practical experience of aviation would be of greater value in an advisory capacity than so important a person as Sir Frederick Hall.

The interest of the Royal Aero Club in this Board is presumably confined to the Sport of Flying. Sir Capel Holden has long been a most respected member of the Committee of the Royal Aero Club and has religiously attended every meeting organised by the Club or run under the auspices of the Club. At the same time one is strongly of the opinion that it would have been better to have appointed some member of the Royal Aero Club who has had experience as a pilot, especially in view of the fact that General Branker is the sole and only member of the whole Board who can claim to be an active pilot. Sir Geoffrey Salmond was an uncommonly good pilot in the early days of the R.F.C. and during the War, and he still flies as a passenger to an extent which is really not demanded from an Officer of his rank. At the same time it is hardly fair to expect him and General Branker to know precisely the views of the sporting pilot which should be represented on the Board by the representative of the Royal Aero Club.

The appointment of Colonel Mervyn O'Gorman as representative of the Royal Aeronautical Society is wholly commendable. Colonel O'Gorman does not pretend to be a practical aviator, but there are very few practical aviators who know anything like as much about flying as he does. Apart from that his scientific knowledge is such as to give everybody complete confidence in his ability to keep the Board straight on either engineering or aerodynamical questions.

The Aircraft Trade is very worthily represented by Sir Henry White Smith. Sir Henry has been in the trade since its beginning, and his outlook is essentially that of the British business man, so undoubtedly on commercial matters his opinion will be of distinct value.

### The Uses of the Board.

One hopes that the eminent gentlemen composing the Board will not take their duties too seriously. If they do they will probably waste an enormous amount of valuable time which each one individually could spend more profitably. One inclines personally to the belief that the appointment of the Board is essentially a piece of window-dressing on the part of the Air Ministry. If any good comes of it so much the better, but if, like Mr. W. S. Gilbert's House of Lords, it "does nothing in particular and does it very well" nobody will be very much disappointed. At any rate it has the opportunity of keeping public interest mildly alive on the question of the cost and practicability of an Imperial Air Mail Service.

Some time ago one had the pleasure of participating with an enterprising Member of Parliament in putting before the Secretary of State for Air a suggestion that occasional announcements of an official nature communicated to the British Press on the subject of the Imperial Air Mail Service might keep alive that interest in airships which might otherwise die during the next few years while airships are lying dormant owing to lack of funds.

Enthusiasts like Mr. Ashbolt, the able Agent-General for Tasmania, and General Branker and Commander Boothby and Mr. Holt Thomas and one or two others, are like voices crying in the wilderness. If they are condemned to go on crying during the next few years the daily Press is bound to become bored with the subject and consequently their speeches and lectures will go unreported and their letters to the Press will not be printed. But, if a Committee with a high-sounding title issues from time to time merely printed reports which are not too ponderously worded and are not too inordinately long, the Press, always obedient to Government Departments, will publish those reports in full and so interest will be maintained. To that extent the Civil Aviation Advisory Board may justify its existence.

It will be noted that arrangements have been made for consultation when required with representatives of the Dominions. It is to be hoped that their attendance will be often

required. Mr. Ashbolt at any rate, as the prime mover in the very nearly-successful effort to organise the great Imperial Air Line to Australia, should be practically an ex-officio member of the Board. One hopes that one may yet have the pleasure of congratulating him on the success of the scheme which he has so ably advocated.

### A Strange Omission.

It will be noted that there is not a solitary member of the Board who has displayed any enthusiasm for or knowledge of airships. Presumably the Board may call in airship specialists for consultation, but one cannot help thinking that it would have been better to have appointed somebody with experience of airships as a permanent member of the Board. The question as to whether the route to Australia will ultimately be run by airships or aeroplanes is one which is likely to be discussed continually during the existence of the Board. Therefore it is obviously unfair to leave airship people out of it.

Also one is inclined to think that the Board should have included somebody with actual experience of running air lines. It is quite possible that when the route from London to Australia is properly organised airships and aeroplanes may operate along it simultaneously, the airships doing the long non-stop runs day and night and the aeroplanes doing shorter runs at much higher speeds in the daytime.

Now that we are approaching the period in which aeroplanes will be able to arise from and alight on any decent piece of ground the size of a football field it will naturally be much easier to organise a proper chain of aerodromes along the route, and the safety of flying on this route will be greatly increased by the fact that in case of trouble such aeroplanes will be able to alight practically anywhere without damage to their passengers, on which point there is more to be said at a later stage in this article.

### THE AIR ROUTES.

For some curious reason the organisation of air routes seems to be very much in the public eye at the moment. At any rate, quite a lot of space is being devoted to the subject in the Lay Press. Possibly this is a bad sign in that the Press generally seems to be most interested in those subjects which are most futile and so this newspaper interest may be taken as an evil omen for the real success of Civil Aviation. At the same time, one cannot help feeling that we are on the verge of the real beginning of Civil Aviation. The following notes from correspondents of the *Times* and the *Morning Post* in Holland do in fact indicate that a genuine movement is on foot. It is only to be regretted that we have to wait until January of next year before the German air lines can extend outside German territory.

From the *Times*, Feb. 25th :—

The International Air Conference held at The Hague from Feb. 22th to 24th is over. France, Belgium, Denmark, Sweden, Norway, Germany, Danzig, and the Netherlands were represented, but Great Britain was not.

The meetings were not public, but the correspondent of the *Amsterdam Telegraaf* was told by Herr Wrousky, the manager of the German Luft Reederlei, that the results were important, but he expects that the limitations will be very few. On May 3rd the direct line between Königsberg and Moscow will be opened with Russian machines supplied by the Soviet Government.

Negotiations are now being carried on with France for participation in the line Paris-Berlin-Moscow next year. Next year a line between London and Czechoslovakia will probably be complete, moving the Russian machines supplied by the Soviet Government is obviously merely journalistic brightness, for there are no Russian machines. Also the talk of the negotiations with France and the London-Czech line is probably rot. The really interesting thing is the starting of German building in May and of German extra-territorial flying in January. One wishes every success to our late enemies. The greater their success the better it will be for British Aviation.

The *Morning Post* of the same date adds the following information :—  
England will be represented at the next Conference at Brussels, on July 31st.  
The Association is to open negotiations with the International Postal Union and the Traffic Commission of the League of Nations.  
Knowing something of the jealousy of Post Offices and of the fatality of the League of Nations one does not expect much. But when once the German Aircraft Industry really gets going again we shall then have plenty of the competition which is so good for trade.

Precisely why England was not represented at this latest "Hague Conference" is rather difficult to understand, seeing that we hope some day to dominate commercial air traffic just as we dominate the shipping trade at sea.

### The Real Main Line.

The most satisfactory thing about these meagre reports of the meeting is the way in which all the surrounding countries except France are working in with Germany. There is no

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doubt that the most important of all European air lines is that from London to Brussels with its extensions in various directions to Berlin, Munich, Vienna, Prague, and ultimately (either before or after the great war with the Slavs) to Petersburg, Warsaw and Moscow.

As one has already suggested in this paper, the London-Paris route really leads nowhere, though it is admittedly an excellent demonstration route at the present day. In that respect it has already fulfilled a good purpose in that it has demonstrated (a) that people will travel by air if given the opportunity, and (b) that the French and British departments which ought to have established ground organisation on this route are both thoroughly incompetent.

It will be very interesting to see next year whether the far-seeing, painstaking, and intelligent German organises the ground communications on his air routes better than we have done in this country. Whether the Telefunken Company or other German wireless firms have yet produced wireless telephones as good as ours in this country one does not know, but it seems highly probable that somehow or another the German air lines will acquire wireless telephones and will operate them properly, unlike the way in which the French and British official people have omitted to do so.

The London-Paris line may conceivably be extended in one direction to the Riviera and in the other direction to Bordeaux, Pau, Biarritz, and San Sebastian, but it will bear the same relation to the really serious commercial air lines across Central Europe that the "Southern Belle" Pullman Express on the Brighton Line does to the great business trains on our North-bound railways. That is to say it will be purely a "joy-ride" affair. Therefore it will be interesting to discover which British firm obtains the London-Brussels subsidy which has been left open by the failure to materialise of the line which had already been approved.

#### More Official Silliness.

Appropos the London-Paris airway, a paragraph appeared in the *Times* a few days ago announcing that "preparations will shortly be completed for the lighting of the Paris-London airway, and it is hoped that the night service may begin next month. Aeroplanes will leave Le Bourget and Croydon at 8 p.m., and should arrive at their destinations about 11 p.m."

If this paragraph be true and not merely one of the usual pieces of daily-journalistic foolishness it is simply another indictment of the imbecile policy pursued by the British and French departments which misdeal with Civil Aviation. The goods traffic on the air lines between London and Paris is hardly worth considering for the good and sufficient reason that our trade with France in any case is nothing compared with what it used to be with Germany and will be again. Therefore it cannot be worth while to run a night service for goods only. On the other hand one can scarcely imagine any sane person wanting to leave Paris or London at about 20.00 hours and arrive in the other capital at about 23.00 hours.

There may be, however, something to be said for a machine leaving at 02.00 or 03.00 hours with the daily newspapers. But one machine each way is not worth the expenses of special lighthouses.

For some curious reason this idea of aerial lighthouses seems to have tickled the alleged brains of the Press and also of the British and French Civil Aviation authorities. Neither the Press nor the said authorities seem to have the intelligence to realise that before it is worth while to spend money on night flying it is advisable to establish a thoroughly efficient wireless telephone service which will make it safe to fly in ordinary daylight.

When such a wireless service is organised there will be no need for lighthouses, for the very simple reason that the pilots can be kept on their course by wireless and will not have to bother about lights. For the matter of that, any pilot who really knows his road can pick up his way quite comfortably by the normal lights of the various towns over which he passes, and if the weather were too thick for him to see those lights then he would not see the lighthouses either. Yet proper wireless communication would enable him to come through when it was impossible to see the lights.

#### Those Season Tickets.

Yet another curious sidelight on Civil Aviation is a paragraph which appeared in several papers on March 2nd stating that at a meeting of the Newcastle Chamber of Commerce the previous day it was announced that one of the best-known aerial companies was prepared to inaugurate a passenger service between Newcastle and London provided 100 season ticket holders of £100 each were secured. It was reported that the said Chamber of Commerce decided to support the proposed undertaking.

One would like to hear a good deal more about this proposition. "One of the best-known aerial companies" may mean anything or nothing. One recalls that very shortly after the Armistice there was a huge scheme to establish an air line across the North Sea from Hull. Nothing materialised from that, and one doubts whether the very meagre success

of Civil Aviation during the past two years can have raised such confidence in the hard-headed business men North of the Humber as to give any promise of success to the much less promising proposition of a line between Newcastle and London.

Why anybody should want to fly from Newcastle to London when there is a singularly comfortable and very fast express train service one fails to understand. On the other hand, there is every opportunity of success for a well organised and efficiently run flying boat service across the North Sea.

In any case one feels extremely sorry for the mental state of anybody who imagines that there are 100 business men in London and Newcastle who are likely to hand out £100 apiece for a season ticket on an entirely problematic air line. One cannot imagine a route on which an air line is less likely to be a success.

#### THE SUCCESS OF THE SLOTTED WING.

Actually what one believes to be the most important event of the week, in that its ultimate influence on Civil Aviation will be considerably greater than the appointment of the Advisory Board or the establishment of the various Air Lines heretofore discussed, has been the testing of the Handley Page torpedo-carrying machine. This machine is an ordinary-looking biplane fitted with the Handley Page slots and is in fact the first aeroplane to be flown built expressly for the slotted wing.

One has not been allowed to see the machine and therefore one is not abusing any confidences in commenting on it. Consequently one is at liberty to say that it is an excellent example of the triumph of matter over mind, in that as an aeroplane it is a success in spite of the perfectly absurd way in which the best brains of the Department of Research have dealt with it. Perhaps however it may be best to describe what the machine itself has done and afterwards to explain what ought not to have been done to it.

Therefore let it be said briefly that the machine is, as already mentioned, a biplane with a Napier engine and that as flown during its tests last week it was carrying about 8 lbs. to the square foot. It had been flown a little the previous week but it made its first serious tests on Monday, Feb. 27th. The pilot was Mr. Wilcockson, who is a very able and experienced air line pilot but has not been regarded hitherto as a specialist in testing new and strange machines. Therefore the performance is actually evidence of the maniability of the machine as well as of the versatility of Mr. Wilcockson. There was a fairly fresh wind blowing which of course assisted the machine but also demonstrated its peculiar suitability for air line work.

Getting off the Cricklewood Aerodrome head to wind with both top and bottom slots open the machine lifted in about 10 yards. Thereafter Mr. Wilcockson flew it round for a while showing that it was as controllable in the air as any other machine and then he came in over the aerodrome head to wind at about 1,500 feet, opened the slots and throttled down the engine. The machine then began to sink vertically. As gusts struck it it was blown back a few yards but by dipping the nose or opening his engine slightly the pilot made up his leeway and eventually landed practically at a standstill at a point on the aerodrome vertically underneath where he had shut off his engine.

#### Why the Helicopter?

The get-off and the landing showed that the machine could have got out of and into any ordinary football field with trees round it or that it could have got out of and into a tennis lawn provided that there was nothing higher than a hedge round it. In fact it demonstrated exactly what this paper has been trying to drum into the heads of aircraft manufacturers and aeronautical authorities for a year or more, namely, that with proper wing arrangement it is possible to do all that helicopter experts are trying to do and a little more as well.

Those who are crazy on helicopters, such as sundry Government officials in this and other countries and the daily Press at large, always seem to forget that as soon as a helicopter leaves the ground it must drift to leeward with any wind which happens to be blowing and that the pilot will have to be extraordinarily quick on his controls to prevent himself from being blown into surrounding buildings or trees. Therefore even when helicopters are developed to their fullest extent they will always need a certain amount of clear space in which to manoeuvre and it seems quite likely that the said clear space will be practically as great as that required by contemporary aeroplanes fitted with properly designed wings.

In any case the gears and operating mechanism and so forth of helicopters will always place them at a disadvantage as against ordinary aeroplanes so that for a given engine power the helicopter will never be able to lift the paying load which an aeroplane will be able to lift. If, therefore, the money which is at present being wasted in this country

(Continued on page 179.)





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Yours faithfully,

*H. Shaw*

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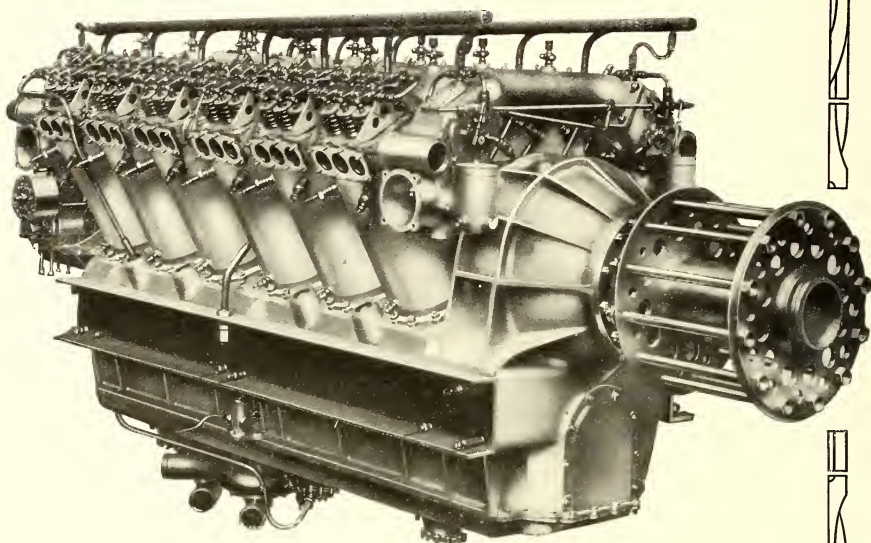
On cessation of hostilities he was attached to a communication Squadron, and took Mr. Bonar Law to Paris on his first visit for the Peace Conference. On leaving the Air Force Mr. Shaw joined the Airco firm, taking the first civilian machine to the Continent for this firm.

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# AERONAUTICAL ENGINEERING

SUPPLEMENT TO "THE AEROPLANE"

INCORPORATING AIRCRAFT ENGINEERING, AERODYNAMICS, AIRCRAFT FINANCE AND COMMERCIAL AERONAUTICS AND MATTERS PERTAINING TO THE AERONAUTICAL ENGINEER AND THE AIRCRAFT TRADER.

## THE WEEKLY COMMENTARY.

In the fourth of the articles entitled "The Commercial Aeroplane" it is sought to show still further how what is called Aerodynamical Research has so far failed to provide the knowledge which is required by aircraft designers, and how important it is that Research workers should be left to carry on the fundamental work which is so seriously needed—leaving it to the designer and constructor to carry out their own specific experimentation.

There is given in this number a short account of the very interesting discussion which was occasioned by S/Ldr. Portal's paper on the subject of Flying Instruc-

tion. It is interesting to observe that although some of the older members recalled certain points in favour of the ancient methods of teaching flying, no one seriously contends that the present method is not a vast improvement when judged by results.

The Presidential address delivered to the Institution of Aeronautical Engineers by Lt.-Col. J. T. C. Moore-Brabazon, which is reprinted in this issue, should serve to define clearly the essential difference of function as between the Institution and the Royal Aeronautical Society.

## THE COMMERCIAL AEROPLANE.

BY W. H. SAYERS.

### IV. Where Research has so far failed.

#### THE EFFECT OF SMALL CHANGES IN SURFACE.

So far it has been sought to show only that the present method of making use of wind-tunnel and other model tests cannot safely be trusted as a guide except in cases where merely minor changes are made in the form of the machine. There is the further question as to what extent they may be relied upon at all as guides as to the behaviour of any body when either the scale or the speed are appreciably altered.

It is well known that what is called the "scale correction" to be applied to model results to enable their use for full-size design is usually admitted to be a perceptible, if small, factor. It is equally well established that in some few cases it has been shown to be a very large factor.

#### SOME PERTINENT RESULTS.

There is, for instance, the case of the wing section known as R.A.F. 19. Tested as a model this wing developed a very high lift coefficient—0.845 in the standard units. Whereas the general experience has been that the "scale correction" determined by full-size tests is such that the lift coefficient of the full-size wing is greater than that of the model, in this case the apparent full-size maximum lift was not only lower than that of the model, but was no greater than that developed by a wing whose maximum lift, both in the tunnel and in the air, was very much less than that of R.A.F. 19 in the model form.

In fact one distinguished aircraft designer who makes large use of the wind tunnel and is of those who advise the most caution in the application of model tests to full-scale work is inclined to the general opinion that at full size all wing sections tend to have a uniform maximum lift of somewhere round about 0.6 and that the wind tunnel habitually underestimates the maximum lift of thin sections and exaggerates that of thick sections.

But there are cases where the evidence points in exactly an opposite direction. If the wind tunnel underestimates the lift coefficient of say R.A.F. 15, it certainly does not greatly underestimate it. And there are at least two cases wherein the stalling speeds of actual aeroplanes have indicated maximum lifts 20 to 30 per cent. greater than those shown by wind-tunnel tests on the relatively heavily cambered wings used.

Leaving out of account the fact that full-size tests as to maximum lift may be entirely vitiated by the effects of imperfect control which makes it impossible to fly the aeroplane concerned at anywhere near the maximum lift of the wings, there is a certain amount of evidence which suggests that it is not safe to regard models as they are made to-day as being reasonably similar to the full-size machines which they represent.

It was recorded in this paper some months ago that the Göttingen wind tunnel had discovered that in the case of certain struts a very small change in the nature of the surface made an immense difference to their resistance. These struts were actual full-size struts, built up, wrapped in fabric, doped and varnished. The surface texture of the fabric was more or less reproduced by the varnish surface, as it is on 90 per cent. of the surfaces used on actual aeroplanes. The struts were tested at velocities up to 30 metres per second—which is a full-scale speed—and in a large number of cases the resistance was very far from following the usually accepted "square law." The resistance coefficient, which should be a constant if the square law held, dropped to a very low minimum value at a speed considerably below that of full-scale flight, but instead of thereafter remaining sensibly constant, it rose again rapidly and continued to rise up to the maximum air speed of the tests.

These struts were sandpapered to remove the slight surface irregularities due to the fabric, and were retested. The resistance coefficient fell as before at low speeds, but having reached the minimum of the previous tests thereafter remained sensibly constant up to the maximum speed. There are also tests made by the N.P.L. on the effect of roughening the surface of an aerofoil of R.A.F. 15 section. By a process of sticking fine sand onto the forward portion of the upper surface of a model the lift was increased and the drag decreased over nearly the whole range of useful angles of attack. The usual polished model does not represent to scale the normal fabric surface of a full-size machine. The sand on the wing model does not represent sand on a full-size wing; if ordinary assumptions as to the nature of scale are accepted it should represent something more like a layer of pebbles.

But if such relatively small changes of surface can produce such serious alterations in the air forces acting on a body it seems fairly obvious that it is unsafe to rely on wind-tunnel tests in any case where previous experience in the full size does not confirm their reliability. Certainly there is not lacking evidence that for any wide departure from the present standard type of aircraft, wind-tunnel tests alone, unsupported by full-size tests, may be very far from reliable guides.

#### THE NEED FOR A CONNECTING THEORY.

There is very obviously a definite connection between model tests and full-size tests; the trouble is that at present the exact nature of that connection is entirely unknown. It is highly important that wind-tunnel tests should be continued, but the main object of those tests for the moment should be



to establish accurately the connection between model and full-size results in order that the relatively easily obtained results of wind-tunnel trials may be used with certainty for design purposes.

The establishment of such a relationship is very decidedly a subject for what has been called fundamental research. It is purely a waste of time from every point of view to continue tests on models in wind-tunnels and full-size machines in the air and to attempt to establish some empirical connection between the two sets of results.

Such empirical formulae exist. There is very little doubt indeed that some at least of these formulae express with a very fair degree of accuracy the difference between model and full-size tests. On the other hand, as is pointed out above, they fail lamentably in certain cases.

They fail because they are merely approximate statements of the result of a number of relatively disconnected experiments, and because they are not based on any reasoned and proved theory which accounts for the forces actually developed by the movement of a solid body through the air.

#### THE LIMITATIONS OF AERODYNAMIC THEORY.

The aerodynamicist at the present moment can give an explanation of the lift forces, and of some of the drag forces which are developed by an aerofoil or by an inclined plane moving through a fluid. In certain cases he can calculate what those forces would be in an imaginary frictionless fluid. And it is an encouraging fact that the forces so calculated for the imaginary fluid are in very good agreement with the forces which act on the same body in a real fluid such as air.

But except as the result of actual trial, no one can put a value to the purely frictional resistance of a body in any real fluid.

It is possible only to calculate that part of the drag of an aerofoil which is due to the fact that it develops a lift. The resistance of a stream-lined strut with its major axis parallel to the wind is a definitely ascertainable quantity—experimentally. There exists no theory which can in any way be said to explain the existence of that resistance, certainly none which allows it to be calculated.

#### THE BASIS OF MODEL TESTS.

The facts of the matter at the present moment may fairly be summed up in a few words. The whole basis of the application of model tests to full-size design rests on what is known as the principle of similarity. This principle has many applications in many different branches of science.

For the purposes now being considered the principle may be stated in this form. If one body is an exact scale model of another in every respect, and if that scale model is tested under conditions such that the air flow round the model is in every respect a model—to the same scale—of the air flow round the other body, then the air forces on the two bodies will be precisely similar and there will be a definite and calculable relation between the magnitude of the said forces.

There is not the slightest reason to doubt the accuracy of this principle. The unfortunate fact is that for any real fluid—such as air—it is fairly certain that precisely similar flow round a practicable model and a practicable full-size aeroplane cannot be secured in practice. It is definitely established that in a large number of cases, particularly of fairly simple bodies, a sufficiently close approximation to similar air flow to give useful results can be attained.

But it is also known that in many cases it is not possible to secure a reasonable approach to similarity. For instance if a really complete model of an ordinary aeroplane—which includes all struts, wires and small fittings—be tested the results may be very misleading indeed.

For this reason it is now standard practice to omit from the model all wires, and to correct the full-size results by adding to the computed resistance without wires the resistance of the wires computed from full-size wire tests.

An American authority even recommends the omission of the interplane struts and the use in the model of the least possible number of circular struts which will hold the model together. These struts are not even to be placed with any regard to the position of the real struts. Their resistance is to be ascertained independently, subtracted from that of the model, and then an allowance is to be made for the real struts on the real machine, just as with the wires. Therefore in practice the principle of similarity is being applied to cases where similarity simply does not exist.

#### FAKED "SIMILARITY."

The fact is, of course, that similarity is unobtainable in the strict sense of the term, and wind-tunnel workers have adopted the practice of attempting to compensate for one set of departures from similarity by making another departure which they hope will produce a compensating change in the value of the forces which they measure. In other words, they do not yet know what "similarity" is. They cannot measure it, they cannot estimate with any accuracy the result of a definite known departure from similarity and they have therefore attempted—by methods which are really as much of the

"rule of thumb" order as those of the average amateur cook—to produce models which behave as though they were similar to the real machine when in fact both they and the conditions under which they are tested depart widely from the conditions on which the whole principle of similarity depends.

#### THE IMPORTANCE OF REAL RESEARCH.

Doubtless many readers of this series of articles will by this time have reached the conclusion that they are an attempt to discredit research work. Quite possibly they will only produce that effect on some readers. That fact is possibly regrettable, but not very seriously so, for those who hold such opinions—whether they originate before or after reading the above statements—cannot but be among those who possess no capacity to understand what research is and what are its uses.

Actually nothing in these articles in any way detracts from the value of research. It is on the contrary urged in the very strongest possible terms that research should be prosecuted with every possible vigour.

But let it be real research—research devoted to an effort to formulate laws—laws as precise as those of the hydrodynamics of the ideal fluid—which apply to the movements of the real fluids of nature. When research has produced such results it should be possible to predict by how much a given change from the conditions of similarity will alter the forces on a specified body and therefore to predict accurately the performance of a full-size machine from a model test.

#### RESEARCH NEGLECTED FOR DISCONNECTED TEST WORK.

Up to the present moment what has been called research in aerodynamics has consisted in the main of a series of disconnected tests of bodies of particular shapes, mostly made with the definite purpose of discovering whether or not the said bodies possessed certain specific qualities. These tests have had their value. They have at least served to impress upon a number of people the fact that there are unexplained discrepancies between the model and the full-size machine, and that there is serious need of research into the laws governing those discrepancies. And of course they have provided data which the engineer in many cases has been able to use with advantage.

But tests of this type do not constitute research. They do not lead to the discovery of basic principles, and owing to the very great volume which such test work has reached, they have seriously impeded the real work of Research. The average aeroplane designer now has at his disposal a very much larger mass of wind-tunnel statistics than he can possibly digest. He has to accompany those results much data as to the performance of full-size machines built up from components for which there are model tests. And sticking to orthodox arrangements of those components he can safely design aeroplanes which in the majority of cases will fulfil his expectations with reasonable accuracy. If he is content with this state of affairs, there is little need for further model data.

But if any designer is not content with the present type of aeroplanes and the probable rate of improvement under present conditions, is it worth while interrupting research work in order to make tests on a model when no one knows what will be the relation between the results and the performance of the full-size machine?

#### TEST WORK IS WORK FOR DESIGNERS.

If the designer feels that he would like model tests of a new type as a possible indication of what may be expected of the full-size machine there is no particular reason why he should not have them. It does not require the equipment and the staff of an N.P.L. to test a model to within the limits of accuracy which will serve his purpose. At least one designer has set up a home-made substitute for a wind-tunnel which gives results that agree with N.P.L. figures with a degree of accuracy than one can attain in translating model figures into machine performance. The total cost of the apparatus was about equal to that of two of the beautifully made aeroplane models which are used at the N.P.L., and one man can operate the apparatus. There is no reason why any competent designer should not equip himself with equivalent apparatus and make his own tests if and when he needs them.

And, although the method of direct comparison between specific models and their full-size counterparts is not likely to lead to the establishment of basic laws connecting the two conditions the data which can be acquired in this way will be very useful when the research worker has produced a tenable theory in checking the adequacy thereof. When the theory is confirmed and checked, it will be mere foolishness to build any new aircraft without preliminary model tests.

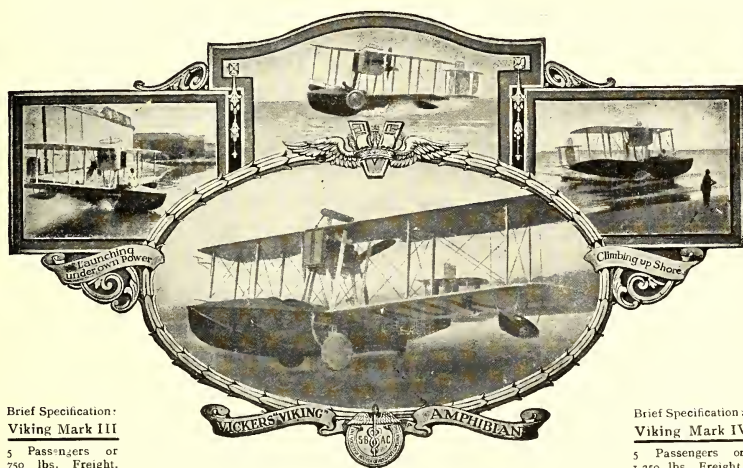
As Col. Beatty said some weeks ago at the Royal Aeronautical Society, a lucky experiment may produce results long before research can predict that result. It is futile to stop practical experiment and await for the teachings of research; it is equally futile to expect lucky experiments to produce knowledge of the type which results from successful research; and it is something considerably more than futile to use equipment and staff suited for fundamental research for casual experimenting.

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## ON TEACHING FLYING.

The paper by S/Ldr. Portal dealing with the training of pilots, which was briefly reported in last week's issue, led to a distinctly interesting discussion. This is reported in abstract below.

## THE DISCUSSION.

Major-Gen. Sir SEFFON BRANCKER (Chairman) said that he was responsible for training at the period when according to the lecturer there was no system. At the beginning of war we knew nothing about flying, the K.F.C. took all the competent pilots, including instructors, to France, and they had to do the best they could with such instructors as were left over. The moving spirit of the revolution in instruction was Col. Smith Barry, and he very much doubted if either the Air Force or the country knew how much they owed to him.

The actual increase in knowledge concerning flying had an immense effect. It was not until a French pilot showed them in 1916 how to get out of a spin that the spin ceased to be regarded as a fatal performance. He believed Lt. Parke very much earlier had got into a spin and got out, but he did not know how he did it.

During the war he had wished to give 30 hours' training before giving pilots their wings, but the Army in the field could not wait for this and they had to be put in the field after 10 hours. He certainly believed that casualties would have been reduced if the longer training had been possible. This view was confirmed by the fact that many very good pilots were very slow to learn.

It was difficult to imagine a better system than the present one, but could it be afforded for commercial pilots? The commercial pilot need not be taught to stunt. Col. Searle believed that if commercial machines were fitted with dual controls apprentice pilots acting as assistants to the chief pilot could be trained on the machines they were to fly in service.

Wing Cdr. I. B. BOWEN said that he had learnt to fly with the assistance of any pilot that happened to be available. Unlike the usual case referred to by the lecturer, for his first solo the whole of his unit turned out to see the show—except his instructor who hid himself till the ordeal was over. After the War he had been taken in hand by the Gosport School, and its teaching was a revelation.

Three senses were concerned in flying, the visual, the aural and the tactile. The present scheme of instruction was based almost entirely on the visual sense. He thought more use might be made of the other two, specially the tactile one. The visual reaction was much slower than the tactile one, and it was possible to fly with eyes shut from the sense of feel, particularly by one's apparent change of weight when turning. Teaching to fly by the use of instruments was, he thought, unsafe, but he thought the turn indicator might be useful.

For commercial piloting he thought it essential that the fullest possible use of instruments should be made.

Mr. A. V. ROE thought that the advantages of starting training straight off the ground had been underrated. He pointed out that the quickest ticket on record (Mr. Pemberton-Billing's) was taken in one morning before breakfast by this method. The pupil got used to the position of landing very rapidly—the 20 hours mentioned by the lecturer as spent in

learning to land in one case seemed an enormous time. He also thought the use of air-cooled radials for training machines would simplify teaching.

Capt. E. F. BRIGGS agreed that the new methods were a great improvement for average cases. Yet the old methods, as practised at Rastchurch before the War, did not produce many crashes. Personally he had always believed in instruments and had had the chance of trying the first Ogilvie air-speed indicator. With that, the old type Naval compass, and the despised Wright bit of string it was possible to fly through clouds as well as with a turn indicator. The lecture did not deal with any but preliminary training. Seaplane instruction raised a number of special problems, but he believed that the system of giving all pilots the same preliminary instruction was sound. He thought it should apply to civil pilots also; these should pass automatically to the Reserve.

Capt. W. H. SAYERS said he had an extended, if not extensive, experience of teaching methods. Not being a pilot himself he had had to teach pupils at the old Avro school before the War. He was not supposed to handle the machine at all, but as a deterrent to the pupils' habit of losing their engines at distant points of the aerodrome he had made a habit of getting into the machine and making the pupil "swing the prop" and walk back to the sheds while he taxied the machine there. He soon found it easier and safer to fly back at two or three feet with the engine throttled, but on one occasion a bump pushed him over the sewage farm and he had to climb, turn round the back of the sheds, and land. There were five landings to that flight, and the effect on his and the pupils' nerves led to a cessation of flying for that day. Since then he had sampled various types of dual control instruction, and quite recently had been taken up by a Gosport type instructor on a Standard training Avro. This was not for instruction but for a demonstration of certain of the things which the Avro ought not to, but did, do. It was not therefore a fair sample, but it was a much more terrifying affair than anything he had yet experienced.

Actually the ancient method of turning the pupil loose was not so dangerous as it seemed, provided the machine was suitable. But the pilot of to-day learnt more about flying before he ever went into the air than anyone knew in those days.

Two points made by the Chairman seemed to call for comment. The first was Parke's dive. He was associated with Parke at the time, and there was no room for doubt that Parke did know how he got out. The second referred to civil pilots and stunting. Anyone who had suffered anything approaching stunting in a commercial machine would agree that pilots should not stunt. But they must know how to, for they might find themselves in positions from which only a "stunt" could deliver them.

Dr. THURSTON said that careful training on the ground, impressing on the pupil's sub-consciousness the correct procedure in emergencies, was an essential to safe teaching.

Capt. BALFOUR thought that to teach 45 deg. turns first was wrong; the 80 deg. turn was much easier and should be taught first.

Major FORBES BENTLEY said that he knew Parke very well and could confirm Capt. Sayers' statement that he knew how he got out of his spin. Comparing present and past methods

**HEAVY WEATHER.**—The photograph here reproduced was taken from a D.H. machine (Rolls-Royce engine) belonging to the River Plate Aviation Company. The machine is over flooded country between the Argentine and Paraguay, the river visible being the Paraguay.

The Company, under the direction of Major Shirley G. Kingsley, late R.A.F., have carried out very extensive tours in South America, and are arousing great interest in the possible uses of air transport in that continent.





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of instruction in the old days the neighbourhood of a flying school was marked by numerous lorries returning with crashed machines. He had watched Cranwell for fourteen months and had not seen one crash.

S/Ldr. PORTAL, in reply said that he had been span and got out by his pilot in 1915. He agreed as to the importance of the tactile and auditory senses in flying but they could not be used for teaching. They were after developments.

The old style of training from the ground was impossible if one had numerous pupils going at once. Also it could not be carried on in a wind. Instruments should not be used for teaching, for if one learnt to fly by instruments and the instrument failed it might lead to death. He seriously meant that the awakening of a dormant carvigg who climbed into the pilot tube might lead to disaster. The pupil should always be in the pilot's seat when under instruction. He did not agree as to the teaching of 80 deg. turns first. They were easier, but were too unexpected a position to start with.

General BRANCKER, in winding up the proceedings, said that if Parke knew how he got out of his spin, the knowledge had apparently not been circulated. He agreed as to the importance of not using instruments for teaching, but their correct use should be taught afterwards, for without training it was impossible to fly in clouds.

### THE INSTITUTION OF AERONAUTICAL ENGINEERS.

Before giving the lecture on "The Early Days of Aviation" which was briefly reported in last week's issue, Lieut.-Col. J. W. C. Moore-Brabazon, M.C., M.P., the new President of the Institution, read a Presidential Address to the members. This address is reproduced below:

"In making a Presidential Address to members of the Institution I feel that the first thing I should devote myself to is the clearing up in many people's minds of the different functions of our Institution as compared with those of the Royal Aeronautical Society. As to the Royal Aeronautical Society I think it only right to say that I am now one of its oldest members, I am a Fellow and on its Council. Not from myself should it look for harm; I am proud of my association with it, and I, and all of us, wish it well. It is the premier Aeronautical Society in the world. Not only do we acknowledge it as such but we expect, and are already getting, its help.

"Some think that the two Societies overlap. That is not so. The Royal Aeronautical Society deals with the subject of aeronautics; we are not concerned with the subject; we are concerned with persons, namely aeronautical engineers. There is a scientific outlook, ours a personal.

"No one can dispute the fact that at the present time, more than at any other, the status, well-being, and general outlook of the aeronautical engineer wants all our help and all our energies to bear it over the lean times which have come upon the movement.

"We are not quite a trade union, but we are near it. We are not all leading lights, or big employers; we are chiefly employees; but we are a very important part of the movement—indeed, a vital part of the movement—and in banding ourselves together for mutual protection we offer no excuse to anybody, knowing that in so doing we are not only helping ourselves, but eventually the whole movement that we have at heart.

"As your elected President for this year I say this to you, that to be successful I expect loyalty to myself as President, while I hold office. I am afraid that I may be somewhat of an autocrat until we are stronger. When that time arrives a more mellow constitutional Government may displace me. During my term of office my services are at your disposal. The guiding policy of your Institution at this time will be a difficult one, but the future success of your Institution depends largely on what is done in the immediate future.

"So much for the personal side. I do not think, however, an address to you would be complete if I did not put before you broadly what I consider the general state of the movement to be at the present time.

"You may think it out of place in a Member of Parliament to remark that you cannot talk yourself into prosperity. Deeds, not words, are what are wanted. If the prosperity of a movement was a function of the papers read about that movement, then commercial aviation would be one of the most flourishing businesses in the world. But it is not so. In my opinion the biggest blow that aviation in its entirety ever sustained was the determination and the action of the French in subsidising the commercial side of it.

"It was a confession of weakness that the movement did not deserve. It could, and would, have worked out its own salvation. How and when the foreign subsidy should have been met and dealt with is not my intention to discuss in this address. Let me tell you, however, that subsidies will not go on for ever.

"Aviation can and will pay its way, even against the most modern modes of transport, but the problem to-day for the engineer is not so much "performance" as pounds, shillings, and pence.

"The requirements of war have in too many cases crystallised our ideas into accepting as final designs that when viewed from a commercial aspect are but empiric.

"Every engineer should approach the science of aeronautics as a revolutionary; we are still beginners at the most wonderful of all modes of transportation.

"It is from members of such an Institution as this that much is expected. You are mostly young, you are in no groove, you are in contact with the actual practical difficulties and requirements that arise from day to day. From whom else can we more justly expect progress?

"Competition in this science will be keen for many years to come. You must arm yourself with all the knowledge obtainable to compete successfully in the struggle.

"At the end of the War this country, faced with all the difficulties it had to contend with, stood pre-eminent in aeronautical matters.

"That high trust is our heritage which we of this Institution must play our part in upholding."

### TESTING AIRCRAFT TO DESTRUCTION.

On Thursday, March 2nd, the Royal Aeronautical Society met to hear and to discuss a paper by Mr. W. D. Douglas of the R.A.E., Farnborough, on Testing Aircraft to Destruction. The paper consists of a fairly complete description of the methods adopted in practice for testing aeroplanes for strength at that establishment.

The paper is too long for reproduction *in extenso* and depends too entirely upon the detail which it contains to repay condensation. The subject is of considerable importance from the designers' point of view because upon the accuracy with which such loading to destruction simulates the load distribution which is met with in flight depends its value in providing a check upon the designers' calculations.

### CRASH-PROOF TANKS.

The final tests of the three tanks selected in the preliminary trials (held last November) for the Air Ministry Crash-proof Petrol Tank Competition were held at the R.A.E., Farnborough, on Monday, Feb. 20th, and Wednesday, Feb. 22nd.

The three final competitors were Commander F. L. M. Boothby's "Gas Armoured Tank," the Imber self-sealing tank, and a tank submitted by the India Rubber and Gutta Percha Company, of Silvertown.

The tests on Monday consisted of crashing and acceleration tests. The crashing test was similar to that of the preliminary trials except that the dummy fuselages containing the tanks, instead of falling upon a bed of sand, were received on a rocky of lumps of concrete and rock.

All three tanks suffered severely in this test, but it is rumoured that the India Rubber and Gutta Percha Company's specimen did not leak, or leaked very slightly after its crash.

Firing tests were made on the 12th. Various types of incendiary, explosive, and armour piercing ammunition was to be used. No details whatever have so far been allowed to leak out as to the results of these trials.

### DEFINITIONS AND NOMENCLATURE OF AIRCRAFT.

The following definitions will be used officially from March 1st by the Air Ministry:—

(1) Aeroplane.—Any aircraft heavier than air, with fixed wings, driven mechanically.

(2) Aeroplane is a generic term and includes:—(i) Amphibians; (ii) Seaplanes; (iii) Landplanes; denoting respectively aeroplanes designed to alight on or take off from: (i) Land or water; (ii) Water; (iii) Land.

(3) Seaplanes include Float Planes and Flying Boats, denoting respectively seaplanes fitted with floats or hull.

(4) Landplanes designed so as to facilitate their landing on a ship's deck will ordinarily be known as Ship Planes.

### A RETIRING OFFICIAL.

Lt.-Col. W. H. D. Clark, O.B.E., Assistant Comptroller of the Patent Office, and lately Assistant Controller and Acting-Controller of the Munitions Inventions Department, Ministry of Munitions, retired from the Civil Service at the end of February.

### THE INDISPENSABLE SMITH.

It is of interest to note that the new Japanese aeroplanes illustrated on page 160 of the current volume of THE AEROPLANE, built by the Mitsubishi Company, are fully equipped with Smiths' Aviation Instruments and K.L.G. Plugs. It is a significant fact that although the machine is equipped with a 300-h.p. Japanese built Hispano-Suiza engine they still come to Smith and Sons for the instruments.

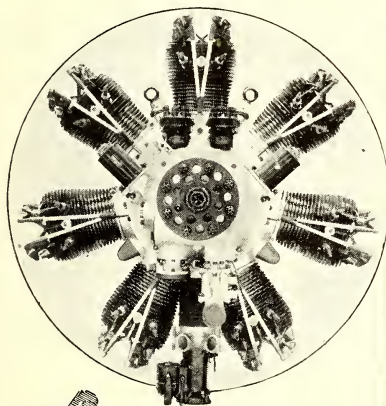
## AN APPRECIATION OF THE DH9c.

The following is an extract from a letter recently received from the Compañía Española de Tráfico Aéreo—the Spanish aerial transport company which is running the Seville-Larache Air Line :—

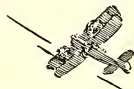
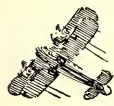
“On the occasion of the completion of the first three months during which we have been operating the first Spanish air service between Sevilla and Larache, we should like to take the opportunity to place on record our satisfaction with the material and personnel provided by you. Using these exclusively, you will be pleased to hear that we have, since the inauguration of our service on October 15th, 1921, till January 15th, 1922, successfully completed 85 return journeys. This represents 42,500 kilometres covered without difficulty or mishap and an incalculable saving in time and increase in regularity over the existing means of transport.”

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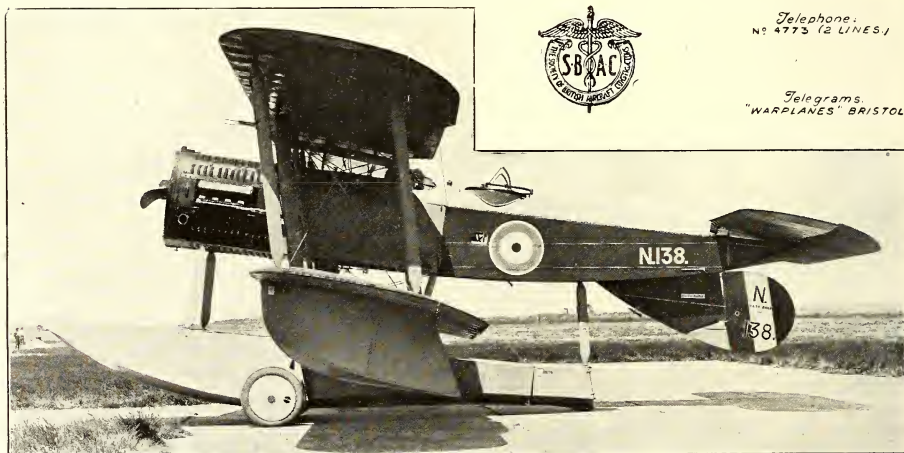
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(Continued from page 168.)

and in France on silly experiments with helicopters were spent on developing the wings of aeroplanes we should be just that much further towards the great goal of aviation, namely, civil aerial transport on a self-supporting basis.

### THE HELICOPTER PRIZE.

The Air Ministry issued the following announcement on March 6th:—

"The Air Council have under consideration the offer of a prize of £50,000 for a Helicopter Flying Machine which complies with certain tests. The conditions under which entries will be received will be announced at a later date, and until this announcement is made no applications or inquiries on this subject can be dealt with whether made personally or in writing.

"Certain applications have been received as the result of a premature announcement in the Press some weeks ago. These will not be dealt with in the meantime."

One merely wonders mildly why, when money is so scarce and when it is perfectly evident, as mentioned above, that so much can be achieved by developing aeroplane wings, the Air Council should even "consider" offering such a huge sum for such remote possibilities. But perhaps that is only their cleverness.

You see if they offered the money for a heavy-oil engine or for something else really useful, the money might be won. Whereas by offering it for a satisfactory helicopter the Air Council gets all the credit of supporting progress without having to pay out any money. And they keep the helicopter cranks quiet.

### Safety and Economy.

The new Handley Page biplane has definitely demonstrated that it can overcome two of the very greatest drawbacks to civil aerial transport as it is at present, namely, the need for a long run in getting off and the danger of high speed landings. The aeroplane that can get into and out of any ordinary field is not only going to increase the safety of flying from the passenger's point of view but it is going to save the majority of the minor accidents which cause aeroplanes to be written off at the expense of the insurance companies although no lives are lost.

One suggests therefore that it would be well for the insurance companies themselves to look into this question very carefully, for obviously the more flying there is done the more money the insurance companies are going to make. The way in which the insurance companies can best assist the development of Civil Aviation is by refusing to insure machines older than a certain date and by insisting on very high premiums for machines which do not include those developments which make for safety in cross-country flying.

### Departmentality Run Mad.

So much, then, for the actual performance of the machine. It seems now worth while to point out the curiously foolish way in which the Department of Research has handled the matter.

In the first place, of course, a passenger-carrying machine of this type ought to have been ordered by the Department of Civil Aviation a year ago when the Department had money to spare, which money was afterwards returned to the Treasury. But of course it would have been too much to expect that Department, as at present constituted, to make up its mind or to give a decision on such a matter without discussing it for at least a year. Therefore, as usual, it was the militant side of the Air Ministry which had to do what the Civil Aviation side should have done.

Unfortunately, however, the enthusiastic technicians of the various sub-departments of the Department of Research were let loose on the unfortunate machine with the result that instead of building a perfectly simple aeroplane to discover what the wings would do they insisted on believing that the wings were already right and proceeded to specify a com-

plete torpedo-carrying ship plane on that basis, each little department loading on all the gadgets with which it is concerned. Which may have been a very pretty compliment to Mr. Handley Page's success in convincing the Authorities of the efficacy of his wing but was certainly asking rather too much of a wing scheme which is still in fact in its experimental stages. For even the Handley Page technical men themselves cannot pretend that the slotted wing is yet approaching its final development, either aerodynamically or constructionally.

Anyhow, the result is that this experimental machine is equipped with so many different gadgets that any pilot told off to fly it as a Service machine will need a special education in handling it.

### The "Heinz" Biplane.

As one has said is only writing of the actual machine from hearsay. Therefore one cannot guarantee that the following description is exact, but it may be taken that it rather under-estimates than over-estimates the number of gadgets.

Those which are supposed to be worked by the hands alone are alleged to be as follows: (1) the ordinary "joy-stick"; (2) throttle lever; (3) spark lever; (4) ignition switch; (5) self-starter handle; (6) tail-adjuster lever; (7) Upper plane top slot operating lever; (8) Lower plane slot operating lever; (9) lever for jettisoning petrol; (10) torpedo-dropping lever; (11) torpedo-heater control; (12) torpedo depth control; (13) release lever for wheels; (14) lever for adjusting deck-landing hooks; (15) radiator shutter lever; (16) night-landing flare controls; (17) navigation light switch; (18) wireless gadgets; (19) machine-gun trigger; (20) bomb-release gear.

One forgets how many more there are to be worked by the feet or teeth apart from dials to be watched, but enough have been mentioned to indicate that a pilot has to have a fairly intimate knowledge of the machine and a fairly cool head to remember even so many different gadgets. There are in fact quite a lot more and consequently the machine is known entirely unofficially as the Heinz, because of its "57 Varieties" of levers and assorted cockpit gadgets.

If the machine is actually a success as a Service torpedo-dropper in spite of all this then of course the triumph for Mr. Handley Page is all the greater. And if the machine comes to an untimely end through some unfortunate pilot jettisoning his petrol when landing under the impression that he is opening his wing slots, then of course no blame can attach to the machine or to its designers and constructors. It is therefore all the more necessary to make it perfectly clear now that under test simply as an aeroplane and not as a jigsaw puzzle for pilots the machine has definitely marked a very considerable step forward in the development of aircraft.

### A Straight Comparison.

There is nothing new in a vertical descent when gliding head to wind. Probably very few of the technical authorities at the Air Ministry or in any other of the Government's aeronautical departments have seen it done. But those mere aeronautical enthusiasts who frequented Hendon before the War have often seen our old friends Louis Noël and Pierre Verrier do a vertical descent from a height of a couple of thousand feet with their engines dead stopped on Maurice Farman's. Also quite a number of the earlier R.F.C. pilots may have seen the skilful aviators of the early days of the War make similar landings on B.E.s against strong winds.

The difference is that whereas in the case of the Maurice Farman the machine was doing these slow glides with a loading of 2 lbs. to the square foot and whereas the B.E.s were doing it with a loading of about 4 lbs to the square foot, the Handley Page did it at 8 lbs. to the square foot. When one gets beyond such weight it is possible by eliminating official gadgets to produce a machine which comes very near carrying a paying commercial load without the aid of subsidies. That is where the real advance has been made.

C. G. G.

## R.A.F. INTELLIGENCE.

### Appointments.

From the *London Gazette*, March 3rd.—RA.F.—GENERAL DUTIES BRANCH.—Wing/Cmdr. F. Rankin, O.B.E., is placed on retired list, March 1st.

### Decorations.

From the *London Gazette*, Feb. 28th.—ADMIRALTY.—The following decorations were conferred during 1926 by the President of the French Republic upon the undistinguished British Naval Officers in recognition of their services during the War. His Majesty the King has given unrestricted permission to the Officers concerned to wear the decorations in question. Croix de Guerre.—F/Lt. S. J. Goble, D.S.O., D.S.C., R.N.; F/Sub-Lt. E. R. Grange, D.S.C., R.N.; F/Sub-Lt. D. M. B. Gallraith, D.S.C., R.N.

### Short Service Commissions.

It is notified for general information that all Officers who applied for Short Service Commissions, under the conditions of Air Ministry Weekly Order No. 781 of 1920, after Nov. 17th, 1920, were informed that the period of active service had been extended to four years.

The Gazettements were carried out as follows: (a) From the inception of the Short Service Commission Scheme all appointments notified in the *London Gazette* up to and including the issue of Jan. 25th, 1921, were for three years on the active service list, unless otherwise stated. (b) All appointments notified after Jan. 25th, 1921, were for four years, unless otherwise stated.

The engagements of all officers entered under the conditions of Air Publication 793 are for four years on the active list.



# COMMERCIAL AERONAUTICS

## AND CIVIL AERIAL TRANSPORT.



THE UNITED KINGDOM OF GREAT BRITAIN AND IRELAND.

### CONTINENTAL ARRIVALS AND DEPARTURES.

[The following table of arrivals at and departures from the British Air Ports is compiled on the following system:—First comes the initials of the Air Line; next the type of machine; next the intercontinental number of the machine; next the ports of departure and destination; next the time of departure and arrival; next the cargo, whether goods (G) and/or mails (M); next the number of passengers; and finally the name of the pilot and number of mechanics, if any.]

ABBREVIATIONS:—A.D.—Aircraft Disposal Co. B.A.—Berkshire Aviation Co. B.C.—Bristol Aeroplane Co. B.M.—Brompton Motor Co. C.A.—Department of Civil Aviation. D.H.—De Havilland Aircraft Co. G.E.—Compagnie des Grands Express Aériens. H.P.—Handley Page Transport Ltd. I.L.—Instone Air Line. K.L.—Koninklijke Luchtvaart Maatschappij. L.A.—Leatherland Aviation Services. M.A.—Messageries Aériennes. M.W.—Marconi Wireless Telegraph Co. Ltd. P.O.—Privately owned. P.L.—Peters Ltd. S.P.—Surrey Flying Services. S.N.—Syndicat National pour l'Etude des Transports Aériens (S.N.E.T.A.).

The London Terminal Aerodrome, Croydon. (Telephone: Croydon 2720.)

#### FEBRUARY 27th:

G.E., Goliath, F-GEAD, London-Paris, 12:45-14:45, G., 5, Favreau & 1.  
I.L., DH18, G-EARO, London-Paris, 12:47-15:00, G.M., N.H. Holmes & 1.  
M.A., Goliath, F-ADCA, London-Paris, 12:49-16:00, G., N.H. Le Men & 1.  
P. Caudron, F-ADES, Paris-London, 16:05-13:05, N.H. 1, Poiret.  
G.E., Goliath, F-GEAC, Paris-London, 12:35-16:07, G., 4, Gastoux & 1.  
H.P., HP, G-EATH, Paris-London, 11:45-14:30, G., 3, McIntosh & 1.  
M.A., Spad, F-ADAE, Paris-London, 13:30-16:25, G.M., 3, Portal.

#### FEBRUARY 28th:

I.L., DH18, G-EAWW, London-Paris, 12:49-15:35, G.M., 1, Shaw & 1.  
H.P., HP, G-EATH, London-Paris, 13:21-16:45, G.M., 4, McIntosh & 1.  
M.A., Breguet, F-CMAD, London-Paris, 14:25—, G., 1, Prignon.  
P. Caudron, F-ADES, London-Paris, 15:37—, G., 1, Poiret.  
I.L., DH18, G-EAWO, Paris-London, 08:18-11:39, N.H. 4, Powell & 1.  
H.P., Bristol, G-EAWY, Paris-London, 11:39-14:25, G., 3, Olley & 1.  
I.L., DH18, G-EARO, Paris-London, 12:00-15:00, G., 3, Holmes & 1.  
M.A., Spad, F-ACMI, Paris-London, 13:05-16:25, G.M., 2, Paille.

#### MARCH 1st:

H.P., Bristol, G-EAWY, London-Paris, 12:36-15:45, G.M., 5, Olley & 1.  
I.L., DH18, G-EAWO, London-Paris, 12:37-15:40, G.M., 2, Powell & 1.  
M.A., Spad, F-ADAE, London-Paris, 12:38—, G., 1, Portal.  
H.P., HP, G-EATH, Paris-London, 11:20-14:35, N.H. 6, McIntosh & 1.  
G.E., Goliath, F-ADDI, Paris-London, 11:53-15:16, G., 6, Mire & 1.  
I.L., DH18, G-EAWW, Paris-London, 12:00-14:26, G., 2, Shaw & 1.  
M.A., Spad, F-ACMF, Paris-London, 15:00-17:55, G.M., 1, Range.

#### MARCH 2nd:

G.E., Goliath, F-GEAO, London-Paris, 11:29-13:30, G., 1, Gastoux & 1.  
I.L., DH18, G-EAWW, London-Paris, 12:34-14:30, G.M., 6, Holmes & 1.  
M.A., Spad, F-ACMI, London-Paris, 12:34-14:55, N.H. 2, Paille.  
M.A., Spad, F-ACMF, London-Paris, 12:35-14:55, G., N.H. Range.  
H.P., HP, G-EATH, London-Paris, 12:37-14:50, G.M., 6, McIntosh & 1.  
H.P., Bristol, G-EAWY, Paris-London, 10:38-14:04, G., 2, Olley & 1.  
G.E., Goliath, F-GEAI, Paris-London, 11:50-14:25, G., 1, Chalchambel & 1.  
I.L., DH18, G-EAWO, Paris-London, 12:00-15:12, G., 3, Powell & 1.  
M.A., Breguet, F-ADAT, Paris-London, 13:07-16:25, G.M., N.H. Revenue.

#### MARCH 3rd:

NIL

### The London Terminal Aerodrome.

#### THE AIRCRAFT DISPOSAL CO.

The most notable event of the week was a flight by Mr. Stocken to Brussels on an Avro in the 57 min. on Wednesday. It will be remembered that there was a good line in gales blowing at the time and Mr. Stocken says that it was about the worst trip he has had. He states that he did not fly to Brussels, but was bumped there. He travelled down that mainstay of civil aviation, the railway line from Redhill to the coast, with the machine almost pointing at right angles to it.

On Tuesday Mr. Meir flew to Cricklewood on a D.H.18 to collect some films of the Royal wedding and take them on to Glasgow. The films however were not forthcoming until too late so Mr. Meir, accompanied by the 9a, returned to Croydon the next morning.

This week the first signs were manifested of the apparent demolition of the Besseneux Portable (1) hangars. These are all to be cleared away by Easter. This clearance will actually increase the size of the landing area materially.

#### THE AIR LINES.

There were several special trips booked to carry photographs and films of the Royal wedding on Tuesday. Mr. Barnard (The Commodore) on the D.H.18a made a quick return flight to Manchester with a strong side wind blowing. He averaged one and a half hours each way.

M. Poiret, of Michelin Cup fame, came over from Paris to fetch films of the Wedding on a Caudron C.60 with 130 h.p. Clerget engine. The machine is more or less of Avro type.

On Wednesday the Napier-Bristol, a D.H.18 and a Spad were all ready to take off simultaneously and all started to taxi to the other side at once. Owing to its wonderful undercarriage the 18 easily won the taxiing race and was in the air first, followed shortly after by the Spad who got on the "road" first by making a quick turn off the ground, getting bumped about horribly in the process. The Bristol followed a few seconds after, making a more stately turn.

#### MARCH 4th:

I.L., DH18, G-EAWO, London-Paris, 12:38-15:26, G.M., 7, Powell & 1.  
G.E., Goliath, F-GEAC, London-Paris, 12:58—, G., 3, Mire & 1.  
M.A., Spad, F-ACMB, London-Paris, 13:10—, G., 1, Revenue.  
H.P., HP, G-EATH, Paris-London, 11:43-14:30, G., 3, McIntosh & 1.  
I.L., DH18, G-EAWW, Paris-London, 12:00-14:15, G., 7, Holmes & 1.  
M.A., Spad, F-ADAC, Paris-London, 14:05-17:40, G.M., 2, Donchin.

#### MARCH 5th:

I.L., DH18, G-EAWO, Paris-London, 12:05-14:46, G., 5, Powell & 1.

M.A., Spad, F-ADBJ, Paris-London, 13:55-14:15/6th, N.H. 4, Briere

### Inland Flying at Croydon.

Feb. 27th—NIL.  
Feb. 28th—H.P., H.P., test (McIntosh & 1); R.A.C., Avro, joy-rides (Bonham Carter); I.L., Vimy, test (Barnard); I.L., D.H.4, Manchester (Barnard).  
March 1st—I.L., D.H.4 from Manchester (Barnard).  
March 2nd—I.L., Vimy, Manchester return (Barnard); R.A.F., H.P., night tests (Rouch).  
March 3rd—R.A.C., Avro, joy-rides (Bonham Carter); M.W., Avro test (Shaw).  
Feb. 4th—S.F., Avro, joy-rides (Muir); M.A., Spad, test (Revenue).  
March 5th—NIL.

### Flying by The Aircraft Disposal Co.

Feb. 27th—Avro, G-EBBP, test (Stocken).  
Feb. 28th—D.H.9, G-EBBJ, test (Hernel), D.H.9a, G-EAXC, left for Cricklewood and back (Muir).  
March 1st—Avro, G-EBBJ, left for Brussels (Stocken); D.H.9, G-EBBJ, left for Brussels (Hernel).  
March 2nd—Bristol Fighter, M-MRAR, arrived from Paris (Piercey).

### Cross-Channel Statistics.

Week ending March 5th:—  
Machines, 41; Passengers, 125; Crews, 67; Total Personnel, 192  
Corresponding week last year:—  
Machines, 23; Passengers, 41; Crews, 28; Total Personnel, 69

Mr. Shaw took a D.H.18 to Paris on Tuesday and returned on Wednesday. He said that it was about the bumpiest and gustiest day on which he has flown. Mr. McIntosh came in also on a Handley Page, also having the full benefit of the rough weather. A Goliath followed them soon after.

On Thursday Mr. Barnard took the "Vimy" to Manchester in order to brighten London. Not by its absence, as the "Vimy" itself is quite nice and bright, but by bringing some material to London in order that the fair sex may be more brightly clad. Quite what the hurry was one failed to see as a telephone and a train journey would have been as quick as the Vimy's double journey and much cheaper. And anyway the fair sex seem to one to be nice and bright already. One can never quite see the point in these "goods by air" stunts when so much more can be done to convince the public simply by running regularly on time without accidents.

On Saturday Mr. Holmes came in on a D.H.18 from Paris in the middle of a sharp hailstorm.

It is rumored that Col. Searle's airline is to be called "Daimler Airways" and that they are due to operate on and after April 3rd with their alleged pillar box red D.H.34s. The selection of their pilots still seems to be wrought in mystery as are the rest of their plans. Still semi-secrecy has always been the best publicity.

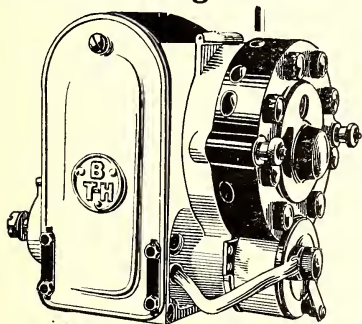
Mr. Duke has not yet returned to Holland on the Fokker. By the way it is interesting to note that all the Fokker mono-planes which ran on the K.I.M. service with one exception were built at the Fokker Works at Schwerin in Germany. The other one was built in Holland. That probably accounts for the excellent way in which the machines have stood up to all the work they have done.

Mr. Bonham Carter has been flying the Royal Aero Club Avros again during the week and Mr. Shaw has been out on the Renault Avro doing "wireless."

On Thursday night an O/400 came in from Biggin Hill and carried out night landings with and without the aid of the light house, searchlights and landing lights.



## Notable Successes with B.T.H. Magnetos



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First Non-Stop Flight London-Madrid (by aeroplane).  
First Flight across Atlantic (by Airship R.34).  
Eighteen British Records made in one day, by one  
Pilot on one machine.  
First and Second Places secured in Aerial Derby.
- 1920—World's Record for useful load carried, height and  
duration.  
British Speed Record (166½ miles per hour).  
Secured five out of eight prizes awarded in Air Ministry  
Trials at Martlesham Heath.  
First and Second Places in Aerial Derby.
- 1921—First, Second and Third Places secured in Aerial Derby.  
Also First and Second Handicap Prizes.

B.T.H. Magnetos also helped to create the latest Speed  
Record held by the Gloucestershire Mars 1.

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On Saturday members of the Institution of Aeronautical Engineers paid a visit to the aerodrome and were shown over the premises.

The Istone Bros. have been making a strong bid for the subsidy for the Brussels air route. At the moment the result of the family effort is not known, but the betting is rather in favour of the concession going to Handley Page Transport Ltd. If so it will afford the Istone Bros. a fine opportunity of demonstrating their faith in Commercial Aviation as they will then be able to start a line to Germany via Brussels without the encumbrance and obligations of a subsidy.—D. D.

### Things People Want to Know.

The exact rank of the Postmaster-General of the Palestine Navy?

Through whom he must be approached for correspondence by mere pilots?

The effect of "Cairo" on the scions of our aristocracy?

The present nationality of the hat of the "Anglo-Parisian" which was bought in Vienna?

What Mr. "Jimmy" James thinks of trams?

And whether the "Bamel" isn't for more controllable?

Who sat on Sir Samuel's hat at the Air Conference?

Whether the sitter varied the camber of the hat into a species of "slot-wing"?

The name of the person who played a whole game of snooker on the aerodrome table without scoring?

Whether Mr. Muir will allow him ever to play again?

### Brooklands.

At the Vickers works the preparation of the "Viking" for Sir Ross Smith's attempt to fly round the world proceeds apace. The hull is practically finished, and it is hoped that the machine will be flying before the end of March.

Two "Viking IVs" have been ordered by the Japanese Government, and are under construction.

A new machine with room for 23 passengers has been ordered by the Air Ministry. The works are busy on "Vernons," and the first of the single-engine (Rolls-Royce "Eagle") eight-seater machines for the I.A.L. is being built, and will be flying in March.

There is no truth in a rumour that has been prevalent in the district that "hundreds" of employees are being discharged from the works. Less than a dozen have been recently given notice, and these are regarded as incompetents. There is still plenty of work to be done. The "City of London" "Vimy" has returned to Croydon after receiving an overhaul, but there is trouble over the Grands Express "Vimy" concerning the engines and the difficulties attached to their not being manufactured in France, which affects, one concludes, the qualification of the machine for the French subsidy.—J. F. S.

### Castle Bromwich.

The Berkshire Aviation Tour has been flying here during the performance of the British Industries Fair which is held on the Aerodrome.

Mr. Brian Ferrand with Mr. Fred Holmes as passenger left Wantage last Wednesday on the Air G-EASE now acquired from Mr. Jones and made Castle Bromwich in 45 minutes.

In four days they took up 127 passengers in competition with a Westland four-seater.

"Gallant Jim" the Berkshire commissioner goes round shouting "Here's the machine a pilot n'everything. That's yours! All I want is your money."

The Tour will remain at "B'rum" until Friday of this week.

Mr. A. S. Keep, pilot of the Westland, was also doing a large amount of flying. The machine was G-EARE, and was much admired. On Friday it was on the go continuously, and was not switched off at all between the hours of 14.30 and 17.30.

### Stag Lane.

On Tuesday the Hire Department of the De Havilland Aircraft Co. was busily engaged in taking the films and photographs of the Royal Wedding to Manchester, Newcastle and Leeds.

Mr. Wilson left Stag Lane at 14.00 hrs. on D.H.9 G-EAAC and made Manchester at 15.50 hrs. Mr. Alan Cobham left on D.H.9c G-EAYU at 14.55 hrs. and made Newcastle at 17.50 hrs. Mr. C. D. Barnard on D.H.9c G-EABX left at 16.00 hrs. and made Leeds at 17.45 hrs.

The result of these successful flights was that films of the Wedding were shown in the above towns shortly after 18.00 hrs.

### The Royal Wedding from the Air.

Miss J. Finet, who has been an enthusiastic passenger in aeroplanes ever since post-bellum civilian flying has been permitted, has sent the following interesting account of her

experiences in seeing the Royal Wedding from the air on Feb. 28th:—

Perhaps it may interest you to hear that I was a passenger in Mr. Chapman's Avro, piloted by Mr. Robinson, M.C. (late of the Berkshire Aviation Co.), and that we went over London during Princess Mary's wedding. We were 5,000 feet high, but could see perfectly well, the huge crowds and the mounted guards with the red coats showing quite clearly. I even saw the time at Big Ben. We had been there some time circling round to get a better view and Big Ben marked 10 minutes past 12.

Trafalgar Square seemed black with people and so was the Admiralty Arch and also Pall Mall. Outside Buckingham Palace as well was a crowd, specially dense around Queen Victoria's Memorial (which, by the way, showed beautifully white). We saw the Life Guards in the yard of Buckingham Palace. Some of the decorations in the streets also showed plainly, lots of flags! We saw also heaps of motor buses stopped and people on the tops watching. We saw the canopy outside the Abbey and crowds waiting, so I think they were a little late in coming out; the service was supposed to be over at 12 o'clock.

Mr. Chapman occupied the other passenger seat. We stayed half an hour over London and the view was glorious. We could see the Welsh Harp from over South Kensington Museum as we were returning and when over the Abbey we could see as far as Greenwich. Lucky indeed that the weather was so clear. It was very windy and bumpy, also rather cold, but neither of us minded.

We landed at Cobham after making a few stunts, and in the afternoon there was a little joy-riding, after which Mr. Chapman went back to Leatherhead. Mr. Chapman is giving joy-rides every week-end at Cobham lately. He is a real sportsman after all the bad luck he has experienced to still persevere with aviation. There ought to be more people like him in the flying world.

To close this letter I must say that I feel very happy and proud to have had the opportunity of flying over Princess Mary's Wedding and her cheering people. I, as a Frenchwoman, will remember this to the end of my days, for no other Frenchwoman has had that bit of luck.

## PERSONAL NOTICES.

### DEATHS.

FOX, DUCKLEY, HEMMINGS, RICHARDSON.—On March 3rd, at Garsort, Suttan, near Ambala, India, as the result of a collision in the air, F/Lt. John Bertom Fox, M.C., F.O. Joseph Buckley, St. Hemmings, and Ac. Richardson, 20 Sqdn. R.F.C.

It would appear from the various accounts of the accident that the machines were two of the three Bristol Fighters which were proceeding from Lahore to Ambala after acting as escort to the Prince of Wales' train.

GRACE.—On Feb. 27th, at Wrotham Heath House, Kent, Percy Russell Grace, late Major, R.F.C. and R.A.F.

The late Major Grace was the fourth surviving son of the late J. W. Grace, Esq., of Leybourne, Kent, and of the late Mrs. Grace, of Elm Park House, London. Born in 1879, he was educated in England, America, and Germany.

Naturally fond of science and mechanics he studied engineering, and although he never obtained a degree he attained to considerable knowledge of the subject. When motoring first came in he was one of the first to own a car, and again when flying machines were first in their infancy he and his brother, the late Mr. Cecil S. Grace, went to the Royal Aero Club ground at Leysdown, in the Isle of Sheppey, in the Autumn of 1908 and began experiments with aeroplanes. They worked hard and began to show practical results in the late autumn of 1909.

Mr. Cecil Grace flew at the Bourne, and when he promptly joined the R.F.C. in a technical capacity. He did much valuable work, especially in Egypt, where he was particularly well known and popular with all ranks.

During his service he contracted tuberculosis in a very virulent form, and from this he never recovered entirely, remaining an invalid until the time of his death. All who knew him will regret deeply the premature end of one who might have done so much more good work had he been spared.

KING.—Drowned off Port Victoria, Ac. Charles Leonard King, R.A.F. MARRIAGES.

ANDERSON—JOSEPH.—On Feb. 2nd, at the British Consulate, and afterwards at All Saints' Church, Cairo, F/Lt. Walter Fraser Anderson, D.S. Sqdn. R.F.C., and H.F. youngest son of the late Capt. John Weir Anderson, of Toronto, Canada, to Phyllis Mary, only daughter of Mr. William O. Joseph, of Zeitzoun, Cairo.

HARRISON—GREY-HEALD.—On Feb. 28th, at St. Peter's, Eaton Square, George F. E. Harrison, R.A.F., to Mary (Moby) Grey-Heald, of Leeds.

ROBINS—HALL.—On Feb. 28th, at St. Mark's Church, Farnborough, P. D. Robins, late R.A.F., of Alton, to Alva Hall, of Farnborough.

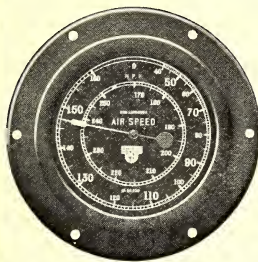
LAMPLUGH.—At Peak Hospital, Hongkong, on Dec. 25th, 1921, the wife of A. G. Lamplugh (late F/Lt., 13 Sqdn.), of a son.

LEACH.—On Feb. 28th, at 55, Rushmore Road, Putney, S.W.15, the wife of S/Ldr. P. A. O. Leach, R.A.F.—a daughter.

### ENGAGEMENT.

MORISON—THOMPSON.—The engagement is announced of Maj. Alan M. Morison, A.F.C., Croix de Guerre, late R.A.F., of Togston Hall, Acklington, Northumberland, only surviving son of John Morison, of 18, Windsor Terrace, Newcastle-on-Tyne, and Hilda Blanche, younger daughter of Joseph Thompson, of East Cliff Mansions, Bournemouth.





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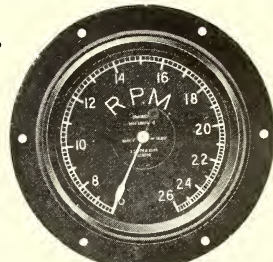
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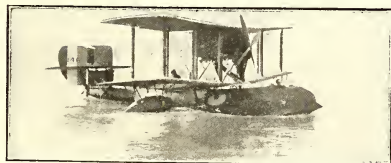
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WEDNESDAY, MAR. 15, 1922.

Edited by  
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Vol. XXII. No. 11.

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## ON THE EVENTS OF THE WEEK.

### THE NAVAL ATTACK.

By the time this issue of THE AEROPLANE is in the hands of its readers the Navy will have delivered, through the mouth of Admiral Sir REGINALD HALL (late Chief of Naval Intelligence), its great attack on the Royal Air Force. At the moment of writing the precise wording of Admiral HALL's motion is not known, but one gathers that it is to the general effect that the Navy shall be allowed to run its own Air Force.

One does not know whether Admiral HALL intends also to suggest that the Army should have its own Air Force or whether he will be content with advocating the resuscitation of the Royal Naval Air Service while leaving the Army to fight its own battle for a Flying Corps of its own. One is however under the impression that the Cabinet has already made up its mind on the subject and that Admiral HALL's motion and the subsequent debate will be merely the second gun in a Naval attack which is likely to be just about as successful as the Navy's attack on the forts in the Dardanelles.

Admiral HALL's motion is obviously the second gun, seeing that the first gun was exploded in the *Pall Mall Gazette* by that misguided ex-Naval Officer in the R.A.F. who, thanks to the kindness of those in High Places, has recently been permitted to retire after a short period on half pay subsequent to a Court Martial.

Obviously, nothing that one can publish in THE AEROPLANE this week can be of any service to those taking part in a debate which will be in progress while this paper is going to press. Therefore one can only promise oneself the pleasure of dealing with that debate next week in the hopes that some of the points in the Naval attack may be hurled back at the Navy in future debates much as were the cannon balls in the old story of the two ships which fought muzzle to muzzle so that the ball from one cannon entered the muzzle of its opposite number and was duly fired back at the ship from which it originated.

### A Step in the Right Direction.

Of course if the Navy had a good case it is quite possible that Tuesday's debate might mark a stage in the process of splitting up the R.A.F. in spite of the Government having made up its mind not to split it at this particular moment. It seems much more likely, however, that the debate will in fact strengthen the position of the R.A.F. and weaken that of the Navy, if the ex-R.A.F. M.P.'s stick to their briefs, for they are naturally much more intelligent than the Naval M.P.'s.

Consequently the debate may be regarded as one step nearer the time when the R.A.F. will be recognised as the first line of defence of the British Empire and when the Navy will be relegated to its proper position as alternatively a species of scavenging police or a transport service for the Army and the Air Force. It may be a good many years before the three Services sort themselves into their proper relations, and one is not so foolish as to imagine that the big battleships which are to-day regarded as capital ships will be or should be abolished within the next few years, but just as surely as the Navy became the first line of defence when sea power asserted itself so surely the Air Force will become the first line of defence as air power increases in importance.

### QUESTION-TIME CONVERSATIONS.

#### R.A.F. Recruiting.

Just as a preliminary to this week's debate there was a lot of desultory skirmishing in the House of Commons on air matters last week, particularly on Thursday, March 9th.

On that day Colonel CAMERON asked a question about the amount of money spent on recruiting advertisements and the number of recruits obtained. Captain GUEST told him that the expenditure was £15,000 on posters, films, etc., and £3,000 on the Stationery Office Vote. As a result during the first 11 months of the year 6,320 recruits had been obtained.

Captain Viscount CURZON suggested that it would save money to combine Navy and Army recruiting, and Captain GUEST replied that the matter was receiving close attention. Colonel ASHLEY then asked why it cost so much more to get

recruits for the Air Force than for the Army, which of course left the way open to Captain GUEST to make the very telling retort that the type of recruits required for the R.A.F. is of a very high standard.

Personally one cannot understand how on earth recruiting for the Navy, Army and Air Force could be combined, as the three Forces are obviously in competition with one another. Naturally any intelligent educated youth left to himself would join the Air Force, and as the Navy's proverb has it, "Nobody but a fool would sell a farm and go to sea," whereas the Army can offer distinct inducements to the farm labourer class.

Judging by the type of man who is now an air mechanic in the R.A.F. one is strongly of the opinion that the Air Force is getting extraordinarily good value from its recruiting department, which one imagines must turn down at least a dozen would-be recruits for every one who is accepted.

### Halton Expenses.

Mr. G. LOCKER-LAMPSON, another of the Navy's henchmen, wanted to know whether "It is proposed to proceed with the large expenditure on buildings at Halton."

Evidently the recommendations of the Geddes Committee that Halton should be closed down has not been taken too seriously by the Air Ministry, for Captain GUEST replied that as the buildings are four-fifths completed it would be very false economy to stop the building seeing that provision would have to be made elsewhere for the training of the boys.

### Air Attachés.

The conversation, so to speak, then switched round to air attachés, who may perhaps be regarded as an unnecessary expense, though if our air attachés abroad are anything like as keen as some of the foreign air attachés in this country the Air Ministry must be accumulating a wealth of valuable knowledge from them which would be remarkably cheap at the price paid.

Captain GUEST, replying to Mr. RAFFER, who may certainly be acquitted of being one of the economy-at-any-price faction, said that we had two air attachés, one at Paris and one at Washington, who draw respectively £4 and £5 per day foreign allowance, which includes entertainment and all other allowances, except travelling outside capital cities. Mr. RAFFER then asked whether it was not a fact that France, "which is so far ahead of us as regards progress in aviation," had decided to dispense with air attachés. Whereupon Rear-Admiral HALL asked who was doing the work if the French air attachés had been withdrawn. Captain GUEST said that he felt convinced that the work was being done by somebody.

The answer to this riddle is quite simple, namely that France is so far behind us in aviation that it has not yet decided to have a separate Air Force, consequently the work of air attachés can be done by an officer of the French Army Aviation Service attached to the office of the Military Attaché. Presumably Mr. RAFFER's remark about France being ahead was "spoke sarkastic."

### The Round-the-World Flight.

The next subject was the projected round-the-World flight by Sir Ross Smith. In reply to Mr. RAFFER, Capt. GUEST said that His Majesty's Government was not financing or subsidising this flight in any way.

That answer disposes of a rumour which has been prevalent in aviation circles of late. The facts being as stated it is all the more to the credit of Vickers Ltd. that they should have undertaken the expense and responsibility for such a big undertaking. If anybody is capable of making this flight certainly Sir Ross Smith with a Vickers "Viking" and a Napier engine ought to be able to do it.

After all his experience of the flight to Australia, and seeing that Italian pilots have already flown from Rome to Japan, the flight is obviously possible, the only grave difficulty being the crossing of the Atlantic, and it may be assumed that so competent an aviator as Sir Ross Smith would not undertake the flight unless he could see a reasonable chance of succeeding.



even on that last and most difficult stage. It is even possible that he may face the Atlantic flight first in order to have it over and done with before tackling the comparatively easier task of the remaining tens of thousands of miles.

#### Civilians at the Air House.

Thereafter there was considerable discussion concerning the employment of civilian officials at the Air Ministry, Mr. RAPER and Mr. SUGDEN taking part therein. The general line of the conversation turned on the fact that men with war service ought to be preferred in preference to anybody else.

With this sentiment of course everyone will agree, but it must be remembered that in a Government office there is certain work to be done which can only be obtained by men with specialised training. Capt. GUEST pointed out that every appointment was carefully considered by a properly constituted board and that he was satisfied that the examination of candidates had been properly and fairly carried out.

#### The Anti-Editorial Crank.

Following this Mr. E. HARMSWORTH, who seems to have some particular grudge against that Department at the Air Ministry which is responsible for producing training-manuals for the Air Force, or else against Air Vice-Marshal J. E. A. HIGGINS personally, asked whether the Central Editing Section of the Air Ministry had been in abeyance during the Air Vice-Marshal's absence at the Washington Conference and whether it was now resuming its functions.

Capt. GUEST made the eminently sensible reply that as no other senior officer possessing the qualifications was available to take charge of the work during the Air Vice-Marshal's absence the Department had been in abeyance and that on his return it was decided that the section should resume its functions for a specified period of six weeks so that certain outstanding items might be completed, and the Department had ceased its functions on the 6th instant.

Mr. HARMSWORTH, who seems quite a persistent person, wanted to know whether "In consideration of the fact that during the absence of this officer in America the section was not considered necessary" it would be possible to dispense with the section in future. Which seems a singularly foolish question in view of Capt. GUEST's previous statement that the Department had ceased to exist.

One would very much like to get at the bottom of Mr. HARMSWORTH's frequent attacks on this Department. Surely even a Member of Parliament cannot be so utterly ignorant as to imagine that a fighting Service can be trained without proper training manuals, nor can he be so foolish as to imagine that such books can be produced without proper editing by an experienced and able officer who is particularly fitted to perform such work. One might as well expect THE AEROPLANE to be a success if compiled by Fleet Street journalists.

#### The Air Estimates.

The last question directly concerning the Air Force was put by the aforesaid Mr. G. LOCKER-LAMPSON, who wanted to know whether the Air Force Estimates of 1922-23 had been framed on the assumption that "no great war is to be anticipated within the next ten years." Capt. GUEST replied in the affirmative, presumably understanding that although Mr. LOCKER-LAMPSON said "anticipated" he really meant "expected."

The question seems singularly unnecessary in view of the fact that the Air Estimates have been cut down by the Air Ministry from £18,000,000 to something like £13,000,000. At such a price it is obviously impossible to maintain an Air Force capable of doing anything more than attend to our little wars in the Dominions overseas and countries over which we hold a mandate. The best we can hope to do with such a sum is to build a nucleus Air Force in anticipation as well as merely in expectation of a great war to come some ten or fifteen years hence.

It seems likely however that long before the ten year period has lapsed the people of this country will have realised that the Air Force must be our first line of defence. When that time comes a very large proportion of the absurdly huge sums which we are still expending on our obsolescent Navy will have been allocated to the Air Force.

#### Non-Service Officials.

Besides all this conversation there had apparently been some little correspondence, judging by the written answers pertaining to air matters. One of the most important of these dealt with the employment of non-Service men at the Air Ministry. Captain GEE in a question suggested that Service candidates for clerical posts at the Air Ministry had been interviewed and rejected by the very non-Service men whom they were sent to substitute.

Another question, addressed by Mr. SUGDEN, amounted to an attack on Mr. NOEL SMITH at present Senior Assistant and private secretary to the Controller-General of Civil Aviation. This question suggested that the official in question had not been called up for Military Service, that he had occupied

numerous positions (which was apparently taken as evidence that he was not indispensable in any position), and that he managed to hold his job thanks to industrial connections. Further the question suggested that there was intense indignation among ex-Service men in the Air Ministry because Mr. NOEL SMITH had not been dismissed and replaced by an ex-Service man.

Capt. GUEST's written reply to this attack would seem to be adequately crushing. He stated that Mr. NOEL SMITH had volunteered three times for Military Service and that both then and when called up under the Military Service Act he had been rejected on medical grounds. Further he stated that no influence had been exercised on behalf of Mr. NOEL SMITH.

Here again one would very much like to know what lies behind this attack. One has occasionally come in contact with Mr. NOEL SMITH in his official capacity and one can bear witness that he is a very capable, competent, and courteous official. It is quite possible that there may be somewhere a man with War Service to his credit who is capable of taking over the work done by Mr. NOEL SMITH, but no matter how able such a person may be he cannot possibly have the experience and intimate knowledge of the working of the Air Ministry possessed by Mr. SMITH.

The fact that Mr. SMITH has moved from one job to another in the Air Ministry appears to be *prima facie* evidence of his ability, in that having done one job thoroughly well he has been moved on to tackle another difficult job in which also he has distinguished himself. The Air Ministry is not so rich in competent civilian officials that it can afford to let a man of proved ability go for the purely sentimental reason that we ought to make England a country fit for heroes to live in, apart from the fact that Service man or civilian anybody has to be something of a hero to live in it at present.

#### THE DEBATE ON IRAQ.

Following the usual discussion over questions the real business of the day began with a debate on the Middle East, the excuse for which was a Supplementary Vote for Mr. CHURCHILL's department. Naturally the debate is of considerable interest to all concerned with the R.A.F. and therefore it is necessary to give as many of the facts of the debate as possible.

#### Mr. Churchill's Statement.

Mr. CHURCHILL stated that when the War came to an end the Army in Iraq and Palestine together amounted to 175 battalions. By April 1st, 1919, this had fallen to 99 battalions and in 1920-21 to 70 battalions. The current year opened with a military force of 45 battalions to be reduced to 37 battalions, the estimated cost of which was to be £32,500,000. Actually by means of economies this had been reduced in fact to £27,000,000 plus the present Supplementary Vote of £1,737,000.

Mr. CHURCHILL then stated that if the arrangements now being made were successful and if the policy which rendered these arrangements possible be carried out and if it be not interrupted by untoward events it is proposed that the Estimates for 1922-23, apart from special charges for the repatriation of 1922-23, will not exceed £9,000,000 or £10,000,000 which represents a pre-war value of only £4,000,000 or so. He had hoped to reduce the troops in Iraq to 12 battalions by the end of this financial year. As a matter of fact they had already dropped to 9 battalions and it was proposed to reduce them to 4 battalions, not more than half of which would be European.

These enormous reductions had been obtained by the use of air power and local levies, the latter under TA'AFAR Pasha, Secretary of State for War for Iraq. The real power in Iraq was a squadron of R.A.F. at Mosul and seven squadrons near Baghdad, where they are concentrated in a loop of the river which renders their bases certainly secure. This was the biggest concentration of the R.A.F. in the British Empire and represented one-third of the whole strength of the R.A.F. Being the biggest British force in the country it was only right that the command in Iraq should follow the bulk of the forces there and the ancillary units, armoured-car companies, steamboats and armoured trains would all be comprised within the general control of the Air Force. The four battalions of the Army remaining in Iraq would be there to keep order in Baghdad and to protect aerodromes from marauders and not for the purpose of wandering about the country on expeditions.

#### Honour Where Due.

Further Mr. CHURCHILL said:—"I should like to say how enormously the whole of this reduction of troops has been facilitated by the Air Ministry and by Air-Marshal Sir HUGH TRENCHARD, whose exploits in the War are so well known. He, again and again, has had to face the terrible difficulty of actually doing things on the spot in contact with hostile influences. He has thrown himself into this task with extraordinary energy and power, and I am most deeply indebted

to him and the Air Ministry for the assistance they have rendered us. It would have been absolutely impossible to secure anything like the saving we have made if it had not been for their whole-hearted co-operation in a scheme which, after all, is of consequence to the Air Force and to the whole position in the future of our aerial army.

"Before I leave the Air Force, I may say that everything goes to show that that force will play a great part in keeping order in these territories—not by violent measures. The mere demonstration of the presence of aeroplanes has again and again been effective in preventing disorder. It has put the civilian officers in close contact with the various tribes, it provides the means of supporting the local levies if outbreaks occur, while it does not involve the movement of bodies of troops and does not place small parties in a position to be cut off and ambushed; neither does it involve long, vulnerable lines of communication. It is a very powerful factor which at present is only in an experimental stage, but which has been gradually growing in its claim on the confidence of the authorities on the spot during the whole of the present year.

"I should like to say that the air mail which I indicated was to be started last year is now running with fair regularity from Baghdad to Cairo. Indeed, one individual has actually travelled from Baghdad to London in from six to seven days. The Government's communications with Iraq have been shortened by nearly two-thirds—by a month out of six weeks—and there is no doubt that the civil communications will go that way by this aerial route as soon as it develops a little further."

#### Assenting Contributors.

Mr. ASQUITH, after criticising the heavy expenditure hitherto necessary in Iraq, expressed his delight that eight squadrons of the Air Force were all that were thought to be necessary in Iraq, but he thought that success depended on peace with Turkey.

In this view Sir CHARLES TOWNSEND concurred.

Major-General SEELY congratulated Mr. CHURCHILL on having carried out his scheme to hand over Iraq to the Air Force. He said that it would be bitterly opposed by old-fashioned people who would say with vigour that to attempt to substitute the good old infantry by these new-fangled aeroplanes was bound to lead this country to disaster. He gave several instances in which small troubles in Iraq had been settled in a few hours by the mere appearance of aeroplanes over the troublesome district.

Further he pointed out that if and when trouble arose in Kurdistan it would be much easier to settle that with aeroplanes than with punitive expeditions into the mountains. Already a rising in Kurdistan had been settled in this way. General SEELY said that he could not help saying "I told you so," for all this was exactly what he had advocated when he resigned from the Government two years ago. He hoped that similar economies would be made all over the Empire in the same way.

#### A Quaint Objection.

Colonel JOSIAH WEDGWOOD, who has some very curious kinks in his brain despite his undoubted gallantry, dug up the old foolish objection that there was a difference between dropping bombs on women and children in Iraq and using shells in France.

He never seems to be able to understand that when a tribe becomes troublesome it is given fair warning of what to expect and that if the tribe keeps its women and children in the village which is to be bombed they are in exactly the same position as those civilians who refused to leave towns in France which were under gun fire. Presumably Colonel WEDGWOOD would rather go back to the old days of punitive expeditions on their own flat feet which lose heavily from sickness in camp and from snipers on the march, which cost millions of money, and which finally accomplish little or nothing.

Mr. (formerly Lieut.-Col.) L'ESTRANGE MALONE said that he thought a great deal might be done with the Air Force in Iraq. No money spent on the Air Service there was wasted. Even if there were no war for twenty years aviators employed in those parts would help the prosperity of the country. He suggested a regular contract between the Postmaster-General and the Air Force for the carrying of mails to Baghdad. He thought it rather singular that air work in the East had to be developed by the military side of the Air Ministry and not by the Controller of Civil Aviation.

#### Wit and Sense.

Lieut.-Col. MOORE-BRABAZON said he looked upon the Secretary of State as a modern Abraham who instead of promising a land flowing with milk and honey promised us a land of oil and money. He wanted to know how long our mandate was to last. Was Iraq ever going to be an asset rather than a liability? Could we not see a vision twenty years ahead when we would still be in the country teaching the Arabs trigonometry and fining them for telling fortunes. It would

not make them any better and it would make us a good deal poorer.

Anyhow, he congratulated Mr. CHURCHILL on his imagination in utilising the Air Force as policemen in Iraq. For the first time in the military history of the World we saw this new Air Force taking charge of a big country with the elder Service ancillary to it.

Capt. WIDGWOOD BENN referred to the forthcoming attack on the independence of the Air Ministry and pointed out that if the House accepted the present position in Iraq it would be too late to attack the independence of the Air Ministry later on. Therefore he thought that those who believe that the interests of the country and of economy are best served by the existence of an independent Air Force were right in assuming that the failure of the opponents to attack this big scheme to-day meant that the opponents of the separate and independent Air Force regarded their case as hopeless.

And so the handing over of Iraq to the R.A.F. passed the House of Commons without a dissenting voice. The fact is worthy of note as an historical event. Probably never in all history has an epoch-making action taken place without some hostile criticism. The fact is a happy omen for the future of the Air Force.

#### THE LAST OF THE AIRSHIPS.

Finally it may be well to say a few words on the subject of airships. On March 8th Mr. GILBERT asked the SECRETARY OF STATE for AIR how many airships are in possession of his department and what was to become of them. Capt. GUEST replied that it was not proposed to retain any of them for Air Force work, and that in view of the present need for economy and of the inability of India and other Dominions to contribute towards their operation on Imperial air routes it had with great regret been decided to pass them all for disposal. The process must necessarily take a few weeks and during that time it was still possible for others to be made with the object of running an airship service. In reply to General SEELY, Capt. GUEST said that even if we disposed of the airships an effort would be made to retain some of the skilled members of the staff in care and maintenance parties.

Naturally those who are chiefly concerned with airships are up in arms against the decision to hand over the airships finally to the Disposal Board.—Incidentally this must not be confused with the Aircraft Disposal Company Ltd., which is a purely commercial concern.—But, as a matter of fact, anybody who takes the long view must agree that the absolute scrapping of the existing airships is the only sound financial proposition.

If we had millions of pounds to spare on running the airship branch of the R.A.F. or if the commercial community had millions of pounds to spare with which to start an experimental airship line the existing airships might be quite useful for the purpose of training crews. But anybody with the slightest knowledge of airships and possessing even a modicum of intellectual honesty must admit that it would be sheer madness to attempt to use any of the existing airships in this or any other country as units on a regular air line.

The wear and tear of R.34 on a single voyage across the Atlantic and back was surely enough to show that the airship of to-day is nowhere within measurable distance of being a commercial proposition. The wrecking of R.38 showed that we have not really enough knowledge in this country to build an airship which is safe. And the refusal of everybody concerned to find the money to organise an airship line shows that we have not the money to spare. Therefore by far the best thing to do is to scrap all our airships and leave the development of airships to people who have money and experience.

The only promising line of development at the moment is the Spanish-German Line to South America. Spain has the money, made by remaining neutral during the War, Germany has the experience gained on active service during the War. By combining the two it is possible that a commercially successful air line may be produced. If that line is successful then some years hence we may find the money to build commercial airships.

It is highly probable that by that time, if those concerned with commercial aviation have any intelligence, we shall be doing so well with aeroplanes that we shall not want to build airships. If we had the money to spare at present we certainly ought to go on with our airship work, but as things are we have done the right thing in scrapping the lot.

There is a place for airships in the development of Civil Aerial Transport, though probably not in air war of the future, but it is evidently not our fate in this country to take part in the progress of airship design and construction. At the same time it is fairly certain that if airships ever become a commercial proposition the English shopkeeper will not be long before he starts to make a profit out of them.—C. G. G.



## R.A.F. INTELLIGENCE.

## R.A.F. Appointments.

Grp/Capt. I. M. Bonham-Carter, O.B.E., from No. 11 (Irish) Wing to H.Q. R.A.F., Ireland. 17/2.  
 Wing/Cmr. G. E. Freyman, D.S.O., O.B.E., from R.A.F. Depot (I.A.) to command No. 11 Wing H.Q. (I.A.). 1/3.  
 Wing/Cmr. N. J. Gill, C.B.E., M.C., from R.A.F. Depot (I.A.) to command Aeroplane Experimental Establishment (I.A.). 1/3.  
 Wing/Cmr. A. V. Dettington, C.M.G., from H.Q., No. 11 (Irish) Wing to R.A.F. Depot (I.A.). 17/2.  
 F/Lt. H. E. Playelle from R.A.F. Depot (I.A.) to H.Q. No. 1 School of T.T. (Boys) (Haltom). 21/3.  
 F/Lt. J. W. Woodhouse, D.S.O., M.C., from No. 1 F.T.S. (I.A.) to C.F.S. (I.A.). 13/3.  
 F/Lt. A. L. Long from No. 6 F.T.S. (I.A.) to C.F.S. (I.A.). 13/3.  
 F/Lt. J. K. Summers, M.C., from No. 5 F.T.S. (I.A.) to C.F.S. (I.A.). 13/3.  
 F/Lt. B. McEntegart from No. 2 F.T.S. (I.A.) to C.F.S. (I.A.). 13/3.  
 F/Lt. H. G. Bowen from R.A.F. Depot (I.A.) to C.F.S. (I.A.). 13/3.  
 F/Lt. J. J. Williamson, A.F.C., from No. 100 Sqdn. (No. 11 (Irish) Wing) to C.F.S. (I.A.). 13/3.  
 F/Lt. A. C. Snow from R.A.F. School (India) to R.A.F. Depot (I.A.). 31/1.  
 F/Lt. L. N. Hollinghurst, D.F.C., from No. 5 Sqdn. (India) to R.A.F. Depot (I.A.). 21/1.  
 F/Lt. D. A. Stead, M.C., D.F.C., A.F.C., from No. 216 Sqdn. (M.E.A.) to R.A.F. Depot (I.A.). 13/2.  
 F/Lt. F. G. M. Williams, from R.A.F. Depot (I.A.) to No. 10 Grp. H.Q. (C.A.). 1/5.

## Finance in the R.A.F.

A "token" supplementary estimate for the year 1921-22 was issued on March 2nd by the Air Ministry. According to the *Morning Post*, which was, so far as one could discover, the only newspaper to pay attention to this very important matter, the authority of Parliament was sought for the grant of a further sum of £10, and authority for the utilisation to the extent of £802,550 of surpluses on certain Air votes and of excess appropriations in aid to be received from the Middle East Department towards meeting the extra cost of the revised programme for Air Services in the Middle East estimated at £450,000; towards meeting the cost of emergency measures taken during the coal dispute estimated at £39,100; towards meeting the cost of research work carried out by the Department of Scientific and Industrial Research estimated at £34,450; and also for the revised programme of works services in the Middle East and elsewhere.

The "token" vote, it is explained, enables the Air Ministry to utilise credits which cannot be utilised in any other way, and notwithstanding the unforeseen liabilities indicated in the Middle East and during the coal strike, economies have been effected which ultimately will more than meet them, and leave a substantial amount for surrender to the Exchequer.

## The Desert Route Again.

Air Commodore H. R. M. Brooke-Popham, C.B., C.M.G., D.S.O., A.F.C., R.A.F., lectured on March 6th before the Central Asian Society on the air route from Cairo to Baghdad. The lecture consisted in essence of that extremely interesting description of the desert route which was published in this paper when delivered before the Royal Aeronautical Society. The rest of the lecture, which was in Air Commodore Brooke-Popham's usual quietly convincing style, was skillfully calculated to convince the intelligent but uninitiated-in-aircraft members of that distinguished Society that 'the aeroplane is essentially the most suitable instrument for transport and police work in Western Asia.

## Prize Bounty.

The award of prize bounty granted for the destruction of the following vessel is now ready for distribution:—The Turkish gunboat *Yaridagari-i-Millet*, by H.M. aeroplane 5,124, on July 9th, 1917.

## The Territorial Anti-Air Force.

The *Times* of March 4th says that the proposals of the Secretary of State for War relative to the strength and administration of the Territorial Army during the next financial year have now been submitted to the presidents and chairmen of County Associations.

The Secretary of State explains that the scheme adopted in 1920 called for an annual expenditure of £7,250,000, and that had been reduced to £5,600,000.

Half a Group of Air defence troops, with an establishment of 220 officers and 2,708 other ranks, will, however, be formed, as it is deemed expedient to make a start in organising Territorial defence troops.

## The Cairo-Baghdad Air Mail.

The Postmaster-General states that the Air Mail which was despatched from London on Feb. 6th reached Baghdad on Feb. 27th. The mail due to be despatched by air from Baghdad on Feb. 18th reached Cairo on Feb. 23rd.

## R.A.F. SPORTS AND PASTIMES.

## The R.A.F. versus the Army.

Playing at Leyton on March 11th, the R.A.F. Rugby team were thoroughly well beaten by the Army by 4 goals and a try (23 points) to a goal and a try (8 points). The Air Force

forwards showed marked superiority in the early part of the game, and until Wakefield left them to reinforce the three-quarter line just before half-time were carrying the majority of the scrums. Wakefield's move certainly resulted in a score, but it was thoroughly bad strategy. The three-quarter line ought to be decided in the committee room, not on the field.

Unfortunately the R.A.F. team lacked any sort of combination outside the scrum, and although the scrum half was getting the ball every time, the stand-off half, as in the Navy match, was slow and undecided, and the passing in the three-quarter line was hopelessly mechanical and bad generally, passes coming too low and being consequently dropped. Some good punting made up for lost ground and the R.A.F. opened the scoring, W. Jones crossing far out on the right. Maxwell failed with the place kick. Some brilliant team work by the Army followed, resulting in two tries, one of them being converted. Just at this point Wakefield left the scrum and a few minutes later, getting the ball from a line-out, he dashed across, the try being converted by Hicks.

Early in the second half the Air Force team were interested spectators of a display of Rugby football by Day, the Army three-quarter, from an opening by Usher he gathered and, sprinting down the touch line quite unhampered, by the R.A.F. defence, swung round and grounded between the posts. He converted his own try and less than five minutes later took the ball from Tennant and did exactly the same thing again.

Then the Air Force woke up and fell upon the Army. Leyton's sooty turf was strewn with recumbent soldiery. The Army being well under control, a gigantic effort, in which Bryson and Turner figured, opened up the game again, and a little three-quarter footwork would have undoubtedly resulted in a score. Two of the team made ineffectual efforts to gather, the Army swooped down on them and the opportunity was lost.

The forwards were splendid in the scrum, and even without Wakefield was almost equal to the Army pack. Russell at scrum-half played a very good game indeed, and Storr on the wing would have done good work if he had not been crowded. As it was he was brilliant in defence, spoiling the Army rushes again and again. The rest of the team were slow, mechanical and lacked combination. It is always so easy to play Rugger from the touch-line! One remains in doubt as to which the R.A.F. needs the more, a new team or a new selection committee.

The R.A.F. team were:—F/O. T. L. Lowe; F/O. H. H. Storr, F/Lt. C. N. Lowe, F/Lt. O. C. Bryson, F/O. W. Jones, F/O. J. T. Jones, and F/Lt. J. C. Russell; F/Lt. W. W. Wakefield (captain), F/Lt. G. H. H. Maxwell, F/Lt. S. P. Simpson, F/Lt. R. H. C. Usher, F/Lt. E. F. Turner, F/Lt. L. Whitworth, S/Ldr. W. C. Hicks, and Sjt. Smith.

## Golf.

At Sunningdale on March 9th the Army beat the Royal Air Force by 10½ points to 7½.

Results (Foursomes):—

Capt. A. G. Barry and Lt.-Col. W. Green o. F/Lt. Hayward and S/Ldr. Thompson (5 and 4) 1.

Capt. W. H. Mirrless and Capt. J. K. Cumming (6 and 4) 1, F/Lt. Bomphrey and F/Lt. Wadhams o.

Major J. F. Hughes and Lt.-Col. B. Eddis ½, Air Com. Munro and F/O. Craik ½.

Capt. B. Bullock Webster and Capt. L. West (2 up) 1, F/Lt. Barr Sim and F/Lt. Lees o.

Major W. C. Morgan and Lt. A. R. Pym (4 and 3) 1, F/Lt. Clarke and F/Lt. Wear o.

Major E. B. Maxwell and Major A. R. MacAllan (5 and 4) 1, S/Ldr. Lowe and Wing/Cmr. Wise o.

Singles (Army representatives' names appear first in each pair).—Barry o. Hayward (3 and 1) 1. Green (1 up) 1, Thompson o. Mirrless o. Bomphrey (1 up) 1. Cumming (6 and 5) 1, Munro o. Hughes o. Wadhams (2 up) 1. Eddis 1, Craik (1 up) 1. Bullock-Webster (2 and 1) 1, Barr Sim o. West (1 up) 1, Wear o. Morgan o. Clarke (1 up) 1. Pym o. Lowe (2 up) 1. Maxwell (5 and 3) 1, Lees o. MacAllan (2 up) 1, Wise o.

## The R.A.F. Boxing Association.

The Annual Air Force Individual Boxing Championships will take place this year in the R.A.F. Depot Gymnasium at Uxbridge on April 6th and 7th. Entries are unlimited for both officers and airmen, but the weights for officers are confined to heavy, middle, welter, light, and feather. Entries should reach the Hon. Sec., R.A.F., B.A., not later than March 31st.

## R.A.F. Team Boxing Championships, 1922.

The boxing for the team Championships took place at Cranwell on Feb. 22nd and 23rd with the following results:—

## OFFICERS.

BANTAM.—O/O. Carter, No. 7 Grp. (Winner); F/Lt. Trevelthan, No. 1 Grp. (runner-up).

(Continued on page 197.)



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tion des hostilités. Dans cette  
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plan central et la queue, etc., sont  
de type normal, et sont construits  
de manière à pouvoir recevoir des  
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des châssis et moteurs d'autres  
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# AERONAUTICAL ENGINEERING

SUPPLEMENT TO "THE AEROPLANE"

INCORPORATING AIRCRAFT ENGINEERING, AERODYNAMICS, AIRCRAFT FINANCE AND COMMERCIAL AERONAUTICS AND MATTERS PERTAINING TO THE AERONAUTICAL ENGINEER AND THE AIRCRAFT TRADER.

## THE WEEKLY COMMENTARY.

The fifth instalment of the articles on the "Commercial Aeroplane," which appears below, points out how great a room there is for aerodynamic improvement in the present-day aeroplane, and suggests that without any revolutionary discoveries of new wing forms or the like a new attitude towards the general problem of aeroplane design may lead to really great improvement.

For reasons advanced in previous articles the question

of whether such improvements will be made or will not be made must for the present depend on aeroplane designers themselves and on their financial supporters.

There will be found in this issue a short description of a new single-engined passenger carrier designed by Vickers Ltd. which possesses a number of novel features.

## THE COMMERCIAL AEROPLANE.

By W. H. SAYERS.

### V. How the Aeroplane Can Be Improved.

From what has been said in the previous articles of this series it will be fairly evident that the designer who sets out with the serious intention of making really important improvements in the efficiency of commercial aircraft to-day must be prepared to take fairly large risks.

He must be willing to face the possibility that model tests will prove absolutely useless as a guide to the probable performance of the full size machine, and he must be ready to back his own intuition in many cases where the pundits, armed with model statistics, will almost certainly attempt to ridicule his proposals.

It is scarcely likely that he will find the Department of Civil Aviation ready to help him in revolutionising aircraft for Government departments have as holy a terror of anything which can be described by that word as has the Editor of this paper. And—as in his case—that terror is not reduced when the revolution is one from chaos and ineffectiveness to orderly efficiency.

The actual problem which is to be faced is essentially a two-fold one. Firstly there is needed a very great improvement in the aerodynamic efficiency of the complete aeroplane. This is roughly measurable in terms of the maximum ratio of lift to resistance of the complete aeroplane, and determines for a given cruising speed the total weight of aeroplane which can be flown by a given power of engine.

Secondly, there is needed the utmost economy in structural weight of that aeroplane so that of the total weight which can be lifted the maximum possible proportion is available as paying load.

#### THE BEST THE MODERN AEROPLANE CAN DO.

A representative modern commercial aeroplane of to-day has a resistance of somewhat round one tenth of its total weight at its best speed. If this best speed is made to coincide—as it should—with the machine's cruising speed, and if that speed be fixed as a standard at 100 m.p.h. the actual h.p. needed to fly level is at the rate of 26 h.p. per 1,000 lbs. Allowing for an aircrew efficiency of 75 per cent. the b.h.p. developed by the engine at cruising speed must be 35 per 1,000 lbs. That is the machine carries 28 lbs. per h.p. developed at that speed. It is not practicable to install an engine capable only of developing 35.5 b.h.p. per 1,000 lbs. of machine—for under those conditions the machine would be unable to leave the ground on any reasonable sized aerodrome, and would have a negligible climb and ceiling. This is particularly the case if the machine be of the heavily loaded, thin-winged type with a high landing and climbing speed.

To provide a reasonably quick get-off, and a reasonable climbing gradient an engine capable of developing about twice the b.h.p. developed at cruising speed must be fitted. It will be found, if specifications of modern commercial aircraft are consulted, that in fact 14 to 16 h.p. per h.p. of engine installed is the average total load carried. A modern engine installation, complete with tanks, can scarcely weigh less than 3½ lbs. per h.p. At half power the petrol consumption will

not be less than .6 lb. per h.p. hour—so that for three hours' cruising  $\frac{1.8}{2}$  lbs. per h.p. installed will be consumed. Allowing a margin for adverse winds, etc., this means that for a three hour flight one must carry a minimum of 1½ lbs. of fuel—or 5 lbs. of engine and fuel—for each h.p. of engine, leaving 10 lbs. per h.p. for aeroplane and load combined.

The best that one can hope to attain with existing types is to build the aeroplane itself for about one third of the total weight or 5 lbs. per h.p., leaving the remaining 5 lbs. of the 15 for pilot and other necessary equipment and paying load.

Actually a capacity of 4 lbs. of paying load per h.p. is higher than any designer can guarantee at the present moment on the basis of 100 m.p.h. cruising speed. It is a figure which is likely to be reached in the near future by continued progress along the present lines of development, but not to be very greatly exceeded.

On the basis of present costs of manufacture this figure represents a capital expenditure of from £2 10s. to £3 for each lb. of paying load capacity. It means that every pound of paying load carried has at the very least to bear the cost of carrying another 2½ to 3 lbs. of non-paying load over the same distance.

#### THE EFFECT OF IMPROVED AERODYNAMIC EFFICIENCY.

Suppose for the sake of argument that it is possible to make the ratio of resistance to lift one half of that of the machine considered above. The immediate effect will be to reduce to one half the b.h.p. needed at cruising speed. That is to say to cruise at 100 m.p.h. only 17.75 b.h.p. per 1,000 lbs. are necessary—in other words one can carry 56 lbs. per b.h.p. instead of 28. It will still be impracticable to fit an engine of the bare power necessary for level flight, for the same reasons as in the previous case. At the worst it will be necessary to give the machine the same excess power per 1,000 lbs. as in the last case to provide an equal climb. It is unlikely that so great an improvement in cruising speed characteristics will be accompanied by no improvement at other and lower speeds, so that in all probability a lower surplus of power will suffice to give an adequate climb. But the required surplus will not be reduced to anything like the extent that the cruising power is reduced—for the very simple reason that a definite power is necessarily expended in climbing which depends only on rate of climb and weight of machine. This amount of power is not dependent on the aerodynamic qualities of the machine, but has to be added to that required for level flight at the climbing speed.

Assuming the worst, then, we must provide surplus to the 17.75 b.h.p. per 1,000 lbs. a further 35.5 b.h.p. for climbing and getting off—a total of 53.25 b.h.p. per 1,000 lbs.—giving a total loading of 18.8 lbs. per h.p.

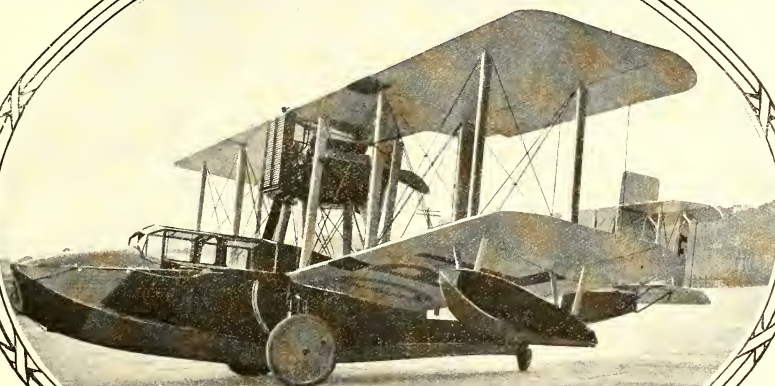
There is no reason why the weight of engine installation should increase beyond the figure of 3½ lbs. per h.p. taken before. On that weight the engine should give more reliable service—for it will now cruise at one third instead of one





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SPAN: 46' 0"  
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**NEWCASTLE:** Commercial Union  
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**GLASGOW:** Vickers House, 247,  
West George Street.

**BRISTOL:** 55, Park Street.

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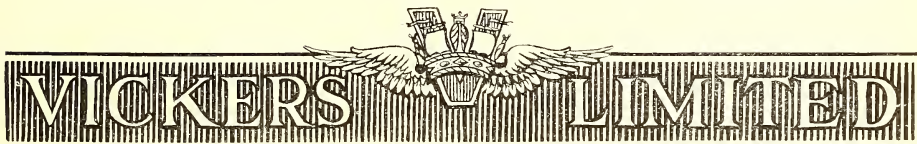
**LEEDS:** Greek Street Chambers,  
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Aviation Department,  
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structure weight—for the weight of fairings and such-like members cannot be reduced below certain limits on account of consideration of fragility, and for a glider of this type weight is of very vital importance.

#### THE EFFECT OF TAILS.

In an earlier article of this series reference was made to a model which had been tested which gave a very high L/D without a tail, and whose efficiency fell off enormously when a tail was added. It is worth while recording that this was a model of bird-like form, with heavily tapered wings, and that body and wings alone had an over-all L/D ratio of over 20. It is true that it has not yet been found possible to add a tail without reducing that ratio to the neighbourhood of 12, but this can only be regarded as evidence that the tails so far tried have failed to accommodate themselves to the system of air flow proper to the remainder of the model, and that the problem is one of either finding a tail form conforming to such an air flow, or modifying the model as a whole so that it produces an air flow to which a tail will conform. It may prove that the problem cannot be solved directly. It is possible that with present types of fixed wing a highly efficient form of general flow is not consistent with the development of the tail forces needed for stability. The Hannover glider figures do not seem to confirm this view.

There is other evidence tending to show that great improvements are within the realms of possibility. The N.P.L. has tested and published the result of tests on certain models known as of Woyewodski type. The general underlying principles on which these models are based is precisely that which has been advocated above. Regarded as an appliance for providing lift at the minimum of drag, there is no body which can compare with those of the forms generally known

as "aerofoil sections." The Woyewodski scheme is the very rational one of making the whole aeroplane a body of this form—in fact of making it one huge wing. The body is really the centre section of this wing. It is of very great chord, and of very deep section. Chord and depth taper very rapidly from the centre for a few feet, but the vertical section through any part from centre line to tip of wing is maintained as recognisably possessing the general features of an aerofoil section.

#### CONFIRMATION FROM MODELS.

So far the models made and tested have proved very conclusively that there are marked advantages to be gained by such a method of design. Unfortunately—in some ways—all the models so far tested have been of projected full size machines, and have embodied many of the bad features of conventional types. Engines, radiators, undercarriages and tails have been appended to them in conventional style, and without that regard for unity of form which has been so carefully safeguarded in the matter of wing and body.

And therefore, although the models promise distinctly better results than do orthodox types of machines, they do not show so startling an improvement as it is believed can be attained by extending the principle of their design to its limits.

There is at the present moment practically no room for doubt that the problem of building a combined body and wing which aerodynamically is as efficient as a really good wing by itself can in fact be solved. Regarded from the ordinary addition of resistances point of view this is equivalent to producing a body of no resistance. There remains the problems of discovering how to stabilise and control that combination, and to fit it with the other essentials of a complete aeroplane, also without adding resistance.

### A DESIGN FOR A NEW VICKERS PASSENGER CARRIER.

The scale drawing published here represents a new Vickers passenger carrier believed to be in course of construction. It is obvious from the drawing that it will possess a number of novel features. Most noticeable is the very great height of the body, which completely fills the gap between the wings. It may be assumed that the remarkable increase in speed found with the fat "commercial" body fitted to the Vimy type is responsible for this feature. For an 8-eater the span (45 ft.) is also distinctly small, and this feature, combined with a large chord and gap, has allowed the designer to use a single bracing bay on each side of the wings.

The body of the machine is built in three sections—a detachable engine unit, followed by the cabin—which it may be presumed is a monocoque arrangement of "Consuta," and a tail framing of the wire-braced type carrying formers to fill it out to the profile needed. The pilot is seated directly behind the forward bulkhead of the cabin, above the front seats therein, and his head projects above the top plane.

The drawings are taken from "Het Vliegfeld."

It would appear that, except under the pilot's seat, the

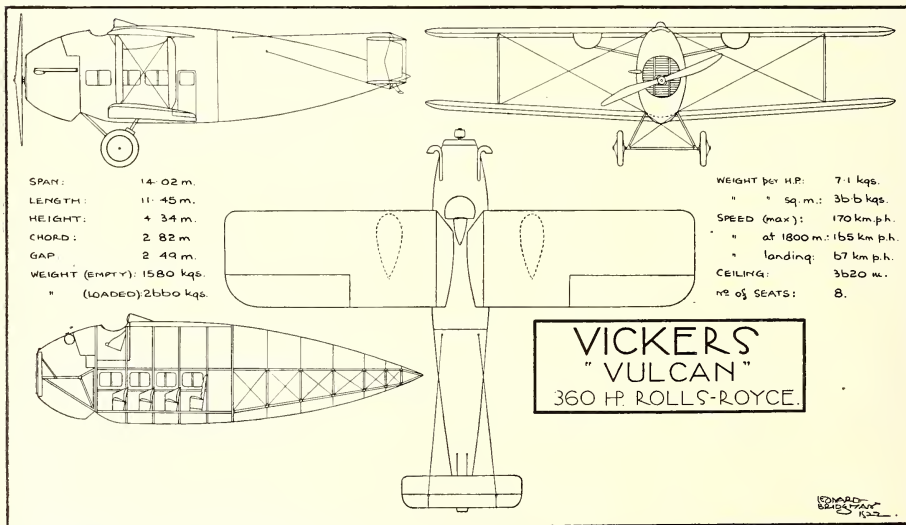
cabin gives a very great amount of headroom. This is an important point, as it allows an ample volume of free air per passenger, and should facilitate proper ventilation without giving rise to draughts.

Petrol tanks are carried on the under side of the upper wings, and it seems fairly obvious that direct gravity feed to the carburettors is used—distinctly a feature making for simplicity and reliability.

A biplane tail is fitted, a somewhat unusual feature in a single-engined machine, and one probably dictated by the desire to keep down tail plane weight and to get a large proportion of tail surface into air undisturbed by flow round the body. It may be found that being of so small a span it will be largely affected by slip-stream effects, and that even at the cost of some slight extra weight, a larger span monoplane tail will give higher efficiency and better controls.

The undercarriage is of what is now becoming a standard for commercial aircraft—the Vee type with the shock absorber inserted in the rear leg of the Vees.

The machine is relatively lightly loaded—about 6.7 lb. per





# AN APPRECIATION OF THE DH9c.

The following is an extract from a letter recently received from the Compañía Española de Tráfico Aereo—the Spanish aerial transport company which is running the Seville-Larache Air Line:—

“On the occasion of the completion of the first three months during which we have been operating the first Spanish air service between Sevilla and Larache, we should like to take the opportunity to place on record our satisfaction with the material and personnel provided by you. Using these exclusively, you will be pleased to hear that we have, since the inauguration of our service on October 15th, 1921, till January 15th, 1922, successfully completed 85 return journeys. This represents 42,500 kilometres covered without difficulty or mishap and an incalculable saving in time and increase in regularity over the existing means of transport.”

The above company is using DH9c machines exclusively supplied by:

**The De Havilland Aircraft Co., Ltd.,**  
**Stag Lane Aerodrome, Edgware, Middlesex, England.**

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sq. ft., according to the specification published—and hence has a distinctly low landing speed (42 m.p.h.). As a result it has a somewhat lower estimated top speed (106 m.p.h.) than is usual with modern British aircraft of this type. It is, however, not impossible that the machine may do better in this respect than is predicted, and in any case it is probable that the distinct decrease of landing speed is well worth purchasing at the expense of a relatively small drop in top speed, particularly as the low landing speed makes for climb at a steep gradient, and therefore facilitates getting off from small aerodromes with surrounding obstructions.

### THE INSTITUTION OF AERONAUTICAL ENGINEERS.

The following fixtures have been arranged during March:—  
March 2nd.—At 3 p.m. Visit to the works of the De Havilland Aircraft Co. Ltd., Stag Lane, Edgware.

At 8 p.m. Paper by Mr. W. O. Manning on "Seaplane Design," Engineers' Club, Coventry Street, W.I.

March 31st.—At 6 p.m. Paper by Mr. H. P. Folland on "Aircraft Design," Royal Society of Arts, John Street, Adelphi, W.C.2.

### AIR MINISTRY NOTICE TO GROUND ENGINEERS.

No. 2, 1922.—AVRO 504K TYPE: GRAVITY TANKS.

- It is hereby notified:—  
1. The gravity tank on the top centre section is to be considered a standard fitting on Avro 504K aircraft.  
2. No Certificate of Airworthiness in respect of this type of aircraft will be issued unless a gravity tank is fitted.  
3. No renewal of an existing Certificate of Airworthiness in respect of this type of aircraft will be granted unless a gravity tank is fitted.  
4. These gravity tanks are obtainable from Messrs. A. V. Roe & Co. Ltd.

No. 3, 1922.—"PETROFLEX" TUBING AND JOINTING.

- It is hereby notified:—The following precautions should be observed when using "Petroflex" tubing:—  
1. The ends of piping or connections to be joined by means of "Petroflex" should be parallel, with sharp edges removed.  
2. Pipes should enter the short lengths of "Petroflex" up to the first corrugation, but no further.  
3. On no account must the lining of the tubing be stretched or contracted by attempting to fit it to connections of a size other than that for which it was manufactured.  
4. Ends of "Petroflex" joints should be slightly bell-mouthed (to the extent of approximately 1/16th in.) in order to prevent the lining from being forced back or injured when assembling.  
5. Care should be taken not to twist or disarrange the tubing during assembly.  
6. Gold size may be applied to the connections before fitting the tubing. This facilitates assembly and makes a good joint. On no account should soft soap or oil be used as a lubricant for this purpose.  
7. Tubing must be securely fixed by means of approved hose clips.  
8. "Petroflex" must not be used in either water or lubricating oil systems.  
9. "Petroflex" tubing should be stored in a dry place.  
Air Ministry, March 3rd, 1922.

### A MATTER OF TUBING.

All those in the Aircraft Industry who have had dealings with Accles and Pollock Ltd., which means practically everybody who has ever been in the Aircraft Industry, will be de-

lighted to hear that in spite of the prevailing bad trade this pioneer firm of aircraft tube manufacturers is very busy indeed. Naturally aircraft tubing is in these days a comparatively small part of the firm's business, but Mr. C. T. Barlow, the Managing Director, says that the number of inquiries which the firm receives from all parts of the World in connection with aircraft is quite astonishing.

It may be taken that these inquiries are only astonishing in view of the apparent slump in aircraft, for it is in fact only natural that any inquiries that are going for aircraft tubing should reach Accles and Pollock Ltd., seeing that that firm has specialised on aircraft tubing ever since aircraft first came into existence in this country in 1909. The firm has, at any rate for the time being, closed the department in which it used to make aircraft parts other than tube, but one can foresee the time when that department also will be busy again, seeing that all-metal aeroplanes are bound to become more and more numerous as time goes on.

The management of the firm is working at high pressure in order to justify big reductions which have been made in the price of tubing, which reductions have been made in order to meet a big demand at a competitive price. Evidently the efforts of the management are proving successful, for their tube mills are at this moment turning out finished tubing at a rate equal to their maximum at the best period of the firm's existence.

Those who imagine that all the industries in this country are at a standstill will be interested to hear that in the year 1920 Accles and Pollock Ltd. delivered over 17,000,000 feet of tubing, and that their current rate of production and sale exceeds 300,000 feet a week. A firm that can do business at that rate in these days is more than a mere enterprising commercial firm—it is distinctly a national asset.—C. G. G.

### THE INDISPENSABLE SMITH AGAIN.

It is of interest to note that as in the case of his flight to Australia Sir Ross Smith has chosen to have "Instruments by S. Smith and Sons (M.A.) Ltd." (to adopt the theatrical programme parlance) on the Vickers "Viking" (Napier engine) on which he is shortly to start his proposed voyage round the World.

The instruments in question make quite an imposing catalogue. They are as follows:—Revolution Indicator, Airspeed Indicator, Oil and Petrol Pressure Gauges, Special Campbell Bennett Apertodic Compass, Altimeter, Cambridge Radiator Thermometer, K.L.G. Sparking Plugs.

One can only hope that the instruments will co-operate to the same happy issue as resulted from the Australian flight.

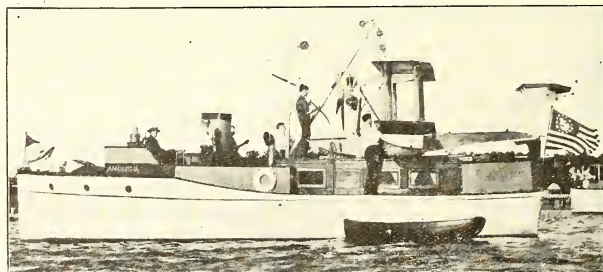
### MORTGAGES, CHARGES & SATISFACTIONS.

CHILON (RICHMOND) LTD.—Particulars of £10,000 debentures, authorised by resolutions of Feb. 3rd and 20th, 1922; charged on the company's undertaking and property, present and future, including uncalled capital.

### SMALL SPORTING SEAPLANES.

The upper of the two photographs shows the little 3-seater Dornier Flying Boat (Siemens and Halske radial engine) on the ice at Lake Constance.

It is reported that this machine has operated very satisfactorily during the past winter, taking-off from and landing on the ice without any modification, and with no damage whatever to the metal hull.



In the lower picture is seen *Argus Jnr.*, a motor launch belonging to Mr. Grover C. Loening, of New York. It is so named after H.M. Aircraft carrier *Argus*, and the reason for the name may be seen on the after deck.

No information is available as to the characteristics of the small flying boat carried by *Argus Jnr.*, but it may fairly safely be assumed to be to Mr. Loening's own design.

(continued from page 188.)

FEATHER.—F/O. Howard, No. 7 Grp. (Unopposed).  
 LIGHT.—F/O. Dufty, No. 7 Grp. (W.); F/O. Battey-Pratt, Cranwell (R.U.).

WELTER.—P/O. Shaw, No. 7 Grp. (W.); F/O. Garrity, Halton (R.U.).

MIDDLE.—F/Lt. Brady, Halton (W.); F/Lt. Porter, No. 7 Grp. (R.U.).

LT. HEAVY.—F/O. Iarrow, No. 7 Grp. (W.); F/O. Berkebeck, Halton (R.U.).

HEAVY.—F/O. Clarke, No. 7 Grp. (W.); F/Lt. Simpson, Cranwell (R.U.).

## OTHER RANKS.

FLY.—AC.1 Minto, Halton (W.); AC.2 Germain, No. 7 Grp. (R.U.).

BANTAM.—Sjt. Sallows, No. 7 Grp. (W.); AC.2 Millington, Halton (R.U.).

FEATHER.—AC.2 Jackson, Halton (W.); AC.2 Kinsman, No. 7 Grp. (R.U.).

LIGHT.—Sjt. Stone, No. 7 Grp. (W.); Cpl. Abbott, Henlow (R.U.).

WELTER.—AC.2 Brady, No. 7 Grp. (W.); Cpl. Cockburn, Halton (R.U.).

MIDDLE.—Cpl. Higgins, Cranwell (W.); Cpl. Kirby, Halton (R.U.).

LT. HEAVY.—L/AC. Blythe, Cranwell (W.); AC.2 Williams, Halton (R.U.).

HEAVY.—L/AC. Fairbrass, Cranwell (W.); Cpl. Barrett, Halton (R.U.).

TEAM RESULTS.—Officers, winning team: No. 7 Grp., 27 pts.; Halton, 11 pts.; Kenley, 5 pts.; Cranwell, 4 pts.

OTHER RANKS.—Halton, 39 pts.; No. 7 Grp., 35 pts.; Cranwell, 23 pts.; Isle of Gram, 13 pts.; Kenley (No. 1 Grp.), 11 pts.; Henlow, 10 pts.; Uxbridge, 7 pts.

## Flowerdown.

(Publication Unavoidably Delayed.—Ed.)

Dear Mr. Editor.—Once more the troops have returned from leave, the last agonised appeal for extension has been ruthlessly negated, the last straggler gathered in, and the regular hum of the hive has made itself manifest.

The Hut Soccer battles are once more in full swing, and, now that the probable winners are becoming apparent, enthusiasm rises to boiling point and many a touch line argument has ended in a sanguinary bout in the parlours of the piggeries. At present No. A6 Hut and Nos. 1 and 2 Dormitories are leading the Van, whilst Dormitories 5 and 6 and Huts A2 and B4 are expecting relegation to the sanitary squad.

Cross-country running seems to be flagging—perhaps the persistent refusal of a certain Flight Lieutenant's Scott to function may have something to do with it, or it may be that the anxieties attached to "dipping the rod" and searching for the "lost gallons that went astray" may have temporarily impaired the athleticism of our cross-country expert.

Our Rugger team has come on wonderfully and is confidently looking forward to the next round of the R.A.F. Rugger Cup. Their opponents—School of Artillery Co-operation, Old Sarum—seem to be suffering from a certain amount of atmospheric disturbance, as so far they have not fielded a team on the dates fixed. The 'A' Team is also going strong and one Saturday ran the Trojans' and Team a very close game, only losing by the odd point in 23.

On Feb. 17th we again had a Hut boxing competition and also the preliminary trials for the Group Team in the R.A.F. Championships. The Hut heroes of former bouts have healed their scars and are once again ready to do battle. The boxing fans are getting ready for a real good time, as much blood is expected to flow and many visages to be disintegrated.

The Senior School Soccer team is still at the top of the Southampton Senior League, and by defeating Southampton Scottish by 2 goals to nil, bid fair to remain Champions to the end.—JEFF.

## Cranwell.

RUGGER.—Interest in Rugger at Cranwell has not by any means abated.

The season opened with a substantial victory over Melton-Mowbray at Cranwell, a result which was repeated away from home in December.

The Cadet College fifteen have beaten us twice, although only after most strenuous and well-contested games. Our best game was against Halkett, whom we defeated by 30 points to nil, we beat the Oundle School eleven without being fully extended, although their three-quarters were in excellent form. Against Stamford we were beaten at home by one try, but we won the return game at Stamford by 16 points to 3.

Our two Lincoln matches we won easily, although we found the second game harder to win than the first, owing to a vast improvement in the Lincoln team work.

We have been well served with good forwards, F/Lt. Jones-Williams, F/Os. Pope, Dixon and Mooley, together with Sjt.

Holt, Cpl. Carnell, L/AC. Diamond and AC. Downey, make a formidable pack. Outside the scrum, F/Lt. Farrington, AC. Slack, and L/AC. Fairbrass have been excellent, while at full-back AC. Hordley has come on a lot since the season opened.

Our captain, the Rev. A. McHardy, a really first-class centre and a Nottingham County three-quarter, has played brilliantly throughout the season, and our success has been in no small measure due to his untiring efforts.

One of the most encouraging features of all has been the enthusiasm for Rugby in the Boys' Wing. The Boys' fifteen are improving every day; their displays against Newark Town "A" fifteen, for example, were very meritorious, both games resulting in substantial wins. Leading Boy Hudson makes a keen captain and he has faithful lieutenants in L/Boys Baldwin, Rollins, House, O'Hanane, Ockenton, and Davies, also Boy Mutch.

HOCKEY.—There is talent for many elevens at Cranwell; the Boys' Wing, for example, can turn out six good sides, as the Inter-Unit Tournament showed, and the Boys' representative eleven has won most of its matches against older teams.

The West Camp eleven, who won the R.A.F. Cup last year, are playing as well as ever.

S/Ldr W. B. Collaway, the captain of the eleven, has unfortunately left Cranwell, F/Lt. A. J. Capel taking over his duties.

Up to date we have played 12 matches and won 11. Cleethorpes have beaten us five goals to two. They are probably the best side in Lincolnshire, and well deserved their win. Sleaford are another strong Lincolnshire side, whom we have beaten twice. The first game, however, was not a fair test, as both sides were weakly represented.

We have been well served by S/Ldr. Burge, ACs. Poole, Gosling and Girtley, F/Lt. Hanner, and AC. Brandon. The Boys' "stars" are Boys Hicks, Chappell and Carter. As in Rugby, the most hopeful feature for the future of R.A.F. games is the excellence of the play shown by many of the Boys.

## 55 Squadron Dinner.

55 Squadron Dinner held on Saturday last was quite one of the most successful functions of its kind. Between 20 and 30 officers were present. Wing/Cmdr. J. E. A. Baldwin, D.S.O., O.B.E., who raised the Squadron originally, was in the Chair, and all the other Squadron Leaders who have commended the Squadron in secession were present. The guest of the evening was Wing/Cmdr. Christie, C.M.G., D.S.O., M.C., who commanded 55's great rival, 100 Squadron, in France.

A notable feature of the gathering was that six officers of the existing 55 Squadron now in Iraq were present, one of them home on leave, and now going out to rejoin the Squadron, and the other five just posted home.

As is usual at 55 Squadron dinners everybody was in the best of spirits and full out for the old Squadron. There was a general feeling that the Squadron reunion was now past the turning point and that in future still more of 55 would turn up at the annual dinner.

## 214 Squadron N.C.O.'s Dinner.

A reunion of 214 Sqdn. arranged by a committee of ex-N.C.O. flying personnel, took place at Pindol's Restaurant on Feb. 25th. The few ex-officers of the Sqdn. who could be traced were unable to attend.

The chair was taken by ex-Sjt. Pilot L. A. Dell, D.F.M., and the following Sjt. Observers were present: A. A. Parker, D.F.M., W. Wardrop, D.F.M., Murphy, D.F.M., E. A. Barber, M.S.M. and T. R. Barber, D.S.M. Altogether over 70 members attended.

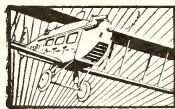
No. 214 Sqdn. was originally No. 72, 5th Wing under Cdr. Spenser Grey and was equipped with Short machines. In 1917 it became No. 14 Sqdn., R.N.A.S., and was stationed at Cookekerque flying Handley Pages. In 1918 it became No. 214 Sqdn., R.A.F., and after the Armistice flew from Camplin (Lille) to Abu-Sa'ir with S/Ldr. Welsh, D.S.C., in command.

Old members are asked to communicate with the Secretary, Mr. R. G. Mitchell, 80, Station Road, Harrow.

## A Mesopotamian Dinner.

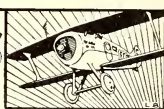
A reunion dinner of the R.F.C. Squadrons which served in Mesopotamia during the latter part of the War was held on the 11th at the Trocadero. Lieut.-Col. J. H. Tennant, D.S.O., M.C., who commanded the R.F.C. in Mesopotamia during those historic times, was in the Chair, and between 40 and 50 past and present officers of the R.F.C. and R.A.F. attended. The Squadrons represented were numbers 30, 63, and 72, and needless to say the affair was a very distinct success. Other officers of the Mesopotamian Wing who were not present at the dinner should communicate with Mr. R. C. Williams, "Fairholme," Dunbar Avenue, Norbury, so that they may arrange to join the next reunion.





# COMMERCIAL AERONAUTICS

## AND MODERN AERIAL TRANSPORT.



### THE UNITED KINGDOM OF GREAT BRITAIN AND IRELAND.

#### CONTINENTAL ARRIVALS AND DEPARTURES.

[The following table of arrivals at and departures from the British Air Ports is compiled on the following system:—First comes the initials of the Air Line; next the type of machine; next the international number of the machine; next the ports of departure and destination; next the times of departure and arrival; next the cargo, whether goods (G) and/or mails (M); next the number of passengers; and finally the name of the pilot and number of mechanics, if any.]

ABBREVIATIONS:—A.D.—Aircraft Disposal Co. B.A.—Berkshire Aviation Co. B.C.—Bristol Aeroplane Co. B.M.—Brompton Motor Co. C.A.—Department of Civil Aviation. H.—De Havilland Aircraft Co. G.E.—Compagnie des Grands Express Aériens. H.P.—Handley Page Transport Ltd. I.L.—Instone Air Line. K.L.—Koninklijke Luchtvaart Maatschappij. L.A.—Leatherhead Aviation Services. M.A.—Messageries Aériennes. M.W.—Marconi Wireless Telegraph Co. Ltd. P.O.—Privately owned. P.L.—Petters Ltd. S.F.—Surrey Flying Services. S.N.—Syndicat National pour l'Etude des Transports Aériens (S.N.E.T.A.).

The London Terminal Aerodrome, Croydon. (Telephone: Croydon 2720.)

#### MARCH 6th:

H.P., D.H.8, G-EAWH, London-Paris, 08.40-11.10, G. Nil, Olley & 1.  
I.L., Vimy, G-EASI, London-Paris, 09.05-12.25, Nil, Robins & 1.  
G.E., Goliath, F-ADTI, London-Paris, 12.05—, G. Nil, Chalmers & 1.  
H.P., H.P., G-EATH, London-Paris, 12.25-13.57, G.M., 2, McIntosh & 1.  
I.L., D.H.8, G-EAWW, London-Paris, 14.37-17.25, G.M., 1, Holmes & 1.  
G.E., Goliath, F-GEAO, Paris-London, 11.49-14.38, G., 3, Favreau & 1.  
H.P., D.H.8, G-EAWH, Paris-London, 12.00-14.11, G., 3, Olley.  
M.A., Spad, F-ACME, Paris-London, 12.25-17.34, G.M., Nil, Delage.  
I.L., Vimy, G-EASI, Paris-London, 13.55-16.10, G., 6, Robins & 1.

#### MARCH 7th:

G.E., Goliath, F-GEAC, London-Paris, 11.30-15.40, G. Nil, Favreau & 1.  
I.L., D.H.8, G-EAWW, London-Paris, 12.15-15.20, G.M., Nil, Robins & 1.  
H.P., Bristol, G-EAWW, London-Paris, 12.20-15.35, G.M., 2, Rogers & 1.  
H.P., H.P., G-EATH, Paris-London, 11.00-14.14, G., 4, McIntosh & 1.  
G.E., Goliath, F-GEAD, Paris-London, 12.06-16.45, G., 2, Gastoux & 1.  
I.L., D.H.8, G-EAWW, Paris-London, 12.09-14.26, G., 6, Holmes & 1.

#### MARCH 8th:

Nil.

#### MARCH 9th:

G.E., Goliath, F-GEAI, London-Paris, 11.50-14.30, G. Nil, Gastoux & 1.  
M.A., Spad, F-ADAF, London-Paris, 12.00-15.25, G. Nil, Donchin.  
M.A., Spad, F-ADII, London-Paris, 12.09-16.15, G. Nil, Briere.  
H.P., H.P., G-EATH, London-Paris, 12.20-15.35, G.M., 2, Wilcockson & 1.  
I.L., Vimy, G-EASI, London-Paris, 12.31-15.30, M., 10, Courtney & 1.  
H.P., Bristol, G-EAWW, Paris-London, 12.00-14.23, G., 5, Rogers & 1.  
G.E., Goliath, F-ADTI, Paris-London, 12.10-14.48, G., 4, Mire & 1.  
I.L., D.H.8, G-EAWW, Paris-London, 12.17-14.48, G., 2, Robins & 1.  
M.A., Breguet, F-CMAB, Paris-London, 13.05-16.15, G.M., 1, Perignon.

#### MARCH 10th:

G.E., Goliath, F-GEAO, London-Paris, 12.20-16.10, G. Nil, Mire & 1.  
H.P., Bristol, G-EAWW, London-Paris, 12.25-14.49, G.M., Nil, Olley & 1.  
M.A., Spad, F-ACME, London-Paris, 12.25-15.06, G. Nil, Delage.  
I.L., D.H.8, G-EAWW, London-Paris, 12.27-14.50, G.M., 7, Holmes & 1.  
I.L., Vimy, G-EASI, Paris-London, 12.00-15.35, G., 4, Courtney & 1.  
H.P., H.P., G-EATH, Paris-London, 12.06-17.30, G., 4, Wilcockson & 1.  
M.A., Breguet, F-ADBM, Paris-London, 13.25-16.45, G.M., 1, Portal.

#### MARCH 11th:

G.E., Goliath, F-GEAD, London-Paris, 12.16-14.55, G., 5, Mire & 1.

### The London Terminal Aerodrome.

#### THE AIRCRAFT DISPOSAL COMPANY.

Mr. Stocken was out early on Thursday morning testing an Avro. He made numerous loops and did sundry stunts.

On Friday a batch of clever F.4 Martinsvies and seven Avros for a foreign Power were put through their paces before the representatives of that Power. Messrs. Stocken, Foot, Carter, Herne, and Murr were kept busy the whole morning doing speed and height tests. During the course of the morning they gave a very fine show, including a very good imitation of a dog-fight which reminded one of the good old war.

On Saturday, Mr. Stocken was testing a Bristol, which machine Mr. Herne afterwards took to Brussels.

On Sunday, Mr. Piercy came in from Paris on a Bristol which had started for Spain, but which met with a mishap in Paris. It has been brought back for examination.

Two of the Bessoneux portable Hangars have been dismantled by the wind and Major Grant hopes to have the whole lot cleared away before the Easter race-meeting.

#### GENERAL FIXING.

Handley Page Transport have now taken over the newest D.H.8 G-EAWX. With this machine, the Bristol ten-seater, the old W.8 and the three new W.8Bs which will be ready almost at once, this line will have a fine fleet of well-tried machines and engines which will enable them to operate the Paris and the Brussels line with the utmost efficiency.

Though at the moment of writing no official announcement has been made there is a general feeling of satisfaction that most likely Handley Page Transport will receive official approval to run the subsidised air line to Brussels. Apart from the fact that they are now entitled to the title "The

I.L., Vimy, G-EASI, London-Paris, 12.27-15.05, G.M., 6, Robins & 1.  
H.P., H.P., G-EATH, London-Paris, 12.32-15.20, G.M., 6, McIntosh & 1.  
M.A., Breguet, F-CMAB, London-Paris, 12.35-15.16, G., 1, Perignon.  
G.E., Goliath, F-GEAI, Paris-London, 1.00—Farnboro Hill, G., 5, Chalmers & 1.

H.P., Bristol, G-EAWW, Paris-London, 13.10-15.10, G., 5, Olley & 1.  
M.A., Spad, F-ADBI, Paris-London, 13.10-16.00, G.M., Nil, Paillet.  
M.A., Spad, F-ADAF, Paris-London, 13.20-16.20, Nil, 5, Range.

#### MARCH 12th:

M.A., Breguet, F-ADBM, London-Paris, 11.20-14.30, G., 5, Portal.  
I.L., D.H.8, G-EAWW, London-Paris, 12.03-14.55, G., 1, Shaw & 1.  
I.L., Vimy, G-EASI, Paris-London, 12.00-14.27, G., 7, Robins & 1.

### Inland Flying at Croydon.

March 6th.—H.P., Bristol tests (Rogers).

March 7th.—H.P., Bristol test (Olley).

March 8th.—Nil.

March 9th.—M.A., Spad test (Donchin).

March 10th.—Nil.

March 11th.—K.L., Fokker test (Duke).

March 12th.—Nil.

### Flying by the Aircraft Disposal Co.

March 6th.—Avro test (Stocken).

March 7th.—Three Martinsvies, tests (Foot); two Martinsvies, tests (Stocken); one Martinsvie test (Muir); three Martinsvies, tests (Carter); three Avros, tests (Carter); two Avros, tests (Herne); two Avros, tests (Stocken).

March 9th.—Bristol Fighter, G-EBBO test (Stocken); Bristol Fighter, G-EBBO, to Brussels (Herne).

March 12th.—Bristol Fighter, M-MRAU, from Paris (Piercy).

### Cross-Channel Statistics.

Week ending March 12th:—

Machines, 44; Passengers, 110; Crews, 74; Total Personnel, 184

Corresponding week last year:—

Machines, 31; Passengers, 60; Crews, 35; Total Personnel, 104

Premier British Air Line," owing to their having been running for at least a year before any other British air line now operating was known to the public, they have also had much experience of the Brussels air line which they operated for many months unsubsidised, though for the last year they have concentrated exclusively on the Paris route.

The Oj/30 fitted with the Bristol "Jupiter" engines is to go to Paris this week to demonstrate the "Jupiters" to the French air authorities.

The Napier engine in D.H.8 G-EARO belonging to the I.A.L. has just completed 200 hours running on the service without overhaul. This sort of thing is very satisfactory as it naturally reduces the amount of work in the shops. Incidentally the particular engine is No. 1 of the Napier "Lion" series and must have been running now for nearly 3 years. It has done over 600 hours or the equivalent of 60,000 miles and this is only its fourth overhaul.

Mr. Robins has developed a very pretty trick when entering the aerodrome from Paris. He flies over the wind indicator keeping the machine on the turn and then, still keeping the machine on a fairly steep bank, comes round into the wind to land, straightening out just before touching. It is very neat and undoubtedly saves an appreciable amount of time.

When Mr. Courtney was taking off on Thursday on the "Vimy" with a load of ten passengers and goods from east to west he had great difficulty in climbing the machine and had to fly straight for some miles before turning. The performance was unusual for so well tried a machine as the "Vimy" so one would like to know whether anything unusual in the way of aircrews had been fitted, as this kind of thing is more often an aircrew effect than anything else. The

get-off of the machine was unpleasant to watch, and caused much comment at the time.

Messrs Shepperson, Bradley, and O. P. Jones, three of the new pilots for the "Vimy" and the D.H.18s, are to do their tests this week in order to get these types on their licenses. On Saturday morning Mr. Duke was testing the Fokker monoplane and on Monday of this week he left for Amsterdam with Mr. Leverton as passenger. He had a strong head wind the whole way to Amsterdam with which to contend. The K.L.M. intend to start in the middle of April with two services per day in each direction. Their pilots will be Mylnehen Hofstra, Geyssendorfer and a new pilot named Van der Hoop.

A thickish fog sprang up on Saturday afternoon which caused an incoming Goliath to have a forced landing in the neighbourhood of Biggin Hill. The machine was somewhat damaged but none of its occupants were hurt, despite newspaper yarns to that effect. Now, if French aeroplanes had wireless telephones it might not have happened at all.

#### STRANGE EVENTS

Considerable concern was manifested at the aerodrome by a notice-board which displayed the statement that a certain firm is "the Premier British Air Line." It is uncertain at the moment whether the word "Premier" refers to Mr. Lloyd George himself or merely the well-known and popular rendezvous in Dover Street.

Now that the run of "Bulldog Drummond" is said to be ending one wonders whether Mr. Basil Foster will display at the aerodrome any of his friend's somewhat alarming tactics to critics, dramatic or business, or whether the family Co-optimism will extend to him also.

An American passenger about to start for Paris said to a certain pilot "Are these machines dangerous?"

"Yes, very," said the pilot, "that's why we charge so much."

The passenger then looked at the machine and asked the pilot why he sat in front.

"Well, you see," said the pilot, "if I sit in front I always get to Paris first."—G. D.

#### Congleton.

The Berkshire Aviation Co. have been flying here and on Sunday they carried 62 passengers. Unfortunately Mr. Robinson has undergone an operation so Mr. Elwin Coles has been deputising for him.

#### The Royal Colonial Institute.

On Thursday, March 9th, Major General Sir Sefton Branner addressed the Royal Colonial Institute on "Flying on the Cairo-Baghdad Route." The R.C.I. took a very lively interest in the debate and several hard-headed business men who had not previously grasped the possibilities of aviation were visibly affected.

Mr. Holt Thomas who was in the chair endeavoured to drum into people's heads that the London-Paris air service demonstrated the possibilities of commercial flying nearly three years ago when A.T. and T. Ltd. was running.

One of those present described how it took several days

to wait at Croydon for a machine to start for Paris and how he eventually got there by water and ground. Also he explained how it took a week for a parcel not to reach Nice despatched by air from London to Paris.

One business man who was there is starting a mining company in Peru. All the transport is to be by aeroplane as the mine is situated over 100 miles from any town.

### PERSONAL NOTICES.

#### DEATHS.

SHALES.—On March 3rd, at Fleet, the wife of F. H. Shales, F/O., R.A.F., of a daughter (still-born).

SHALES.—On March 3rd, at Fleet, Sylvia Violet, the beloved wife of F. H. Shales, F/O., R.A.F., and daughter of J. Charles and Mabel Warner, of St. Mary's, Winchester.

SHIELD.—On March 5th, Christian Eleanor Downes, beloved wife of F/Lt. H. S. Shield.

MULLAN.—At Shotwick, as the result of a flying accident, F/O. Dennis Richard Mullan, R.A.F.

#### MARRIAGES.

BURTON-FREEMAN.—On March 4th, at St. Mary's, Chiddingstone, Eric Burton, R.A.F., son of Mr. and Mrs. F. Burton, of Hildenborough, to Jessie Vivienne, younger daughter of Mr. and Mrs. Sydney Freeman, of Waterlake, Chiddingstone, Kent.

ELSWORTH-CARSON.—On the 6th inst., at Taignton, Devon, Violet, youngest daughter of Percy Elsworth, Director Egyptian Customs (retired), and Mrs. Elsworth, of "Inglewood," Taignton, to F/O. James H. B. Carson, R.A.F., only son of Mr. and Mrs. James Carson, of "Tydford," Highgate.

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 De Havilland Aircraft Co., Ltd., The, Stag Lane Aerodrome, Edgware. "Havilland," Edgware. Kingsbury 160-1, (2 lines) 195  
 Fairey Aviation Co., Ltd., The, Hayes, Middlesex "Airly," Hayes, Middlesex. Hayes, Middlesex 19 ..... 189  
 Roe, A. V., & Co., Ltd., Newton Heath, Manchester. "Triplane," Manchester. City 8350-1, Manchester ..... Inside Front Cover  
 Vickers, Ltd., Vickers House, Broadway, London, S.W.1. "Vickers," Vic, London. Victoria 6000 ..... 193

## AIRCRAFT DISPOSAL.

Aircraft Disposal Co., Ltd., The, Regent House, Kingsway, London, W.C.2. "Airdisco," Phone, London. Regent 6240 (5 lines) ..... Inside Back Cover

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Bristol Aeroplane Co., Ltd., The, Filton House, Bristol. "Aviation," Filton, Bristol 3900 ..... Back Cover  
 Green Engine Co., Ltd., The, 166, Piccadilly, London, W.1. "Airengine," London. Gerrard 8165 ..... Back Cover  
 Rolls-Royce, Ltd., 15, Conduit Street, London, W.1. "Rollad," Reg, London. Gerrard 1654 (6 lines) ..... 190

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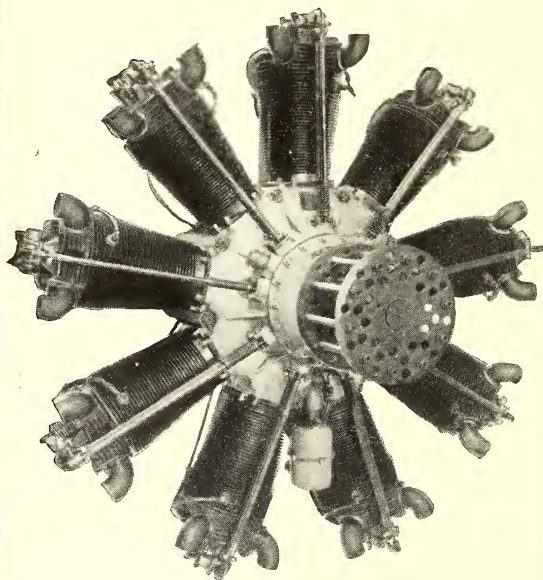
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## WHERE WEST MEETS EAST.



AT TIZNIT.—The two French officers in control at Tiznit, the Moorish City under the Atlas Mountains, with the local Pasha (head of the Berber Tribes), M. Ricard (Controller of Museums for Morocco) and Mr. Alan Cobham, with his D.H.9 (Siddley "Puma").

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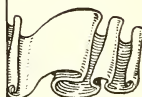
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## ON THE MAGNA CHARTA OF THE AIR FORCE.

On March 16th, 1922—a date which will be for ever famous in the History of England—the Royal Air Force received from the Government, through the mouth of Mr. Austen Chamberlain, the Leader of the House of Commons, its Charter as the First Line of Defence of the British Isles. After that one would feel inclined to sing the *Nunc Dimittis* but for the fact that one has a desire to see the R.A.F. attain to the plenitude of its powers, and incidentally to see Civil Aviation emerge from its present lamentable mis-control and take its proper place as the World's chief method of transport, so that once more one may say, "I told you so!"

By the irony of fate the R.A.F. owes this epoch-making acknowledgment of its status to its old enemy the Navy, which is now beginning to reap its reward for adhering to its Nelsonian methods. Naturally, of course, none of the newspapers recognised the fact that Mr. Chamberlain's statement opens a new era in History, except the *Morning Post*, which burst into metaphorical tears, followed by its usual hysterics, over what it regards apparently as the betrayal of the Navy. This is an excellent sign, for if the ordinary newspapers had recognised the importance of the occasion one would have mistrusted one's own judgment. And if the *Morning Post*, ever the gallant and able defender of lost causes, had agreed with one's own views on the Air Force that would have been the final convincing proof that those views were wrong.

In view of the importance of the occasion it seems well to record at some length the attack on the R.A.F. which led to Mr. Chamberlain's statement. And it also seems necessary to expose the fallacies on which the attack was based.

### The Attack.

In the days when the Fighting Services of the British Empire were enjoying the late lamented War there used to be a sort of standing joke amongst the seafaring people to the effect that if a vessel hit a mine and it went off it was a German mine, whereas if it did not go off it was a product of H.M.S. *Vernon*, the Navy's special torpedo school ship which was supposed to be responsible for the mechanism of the Navy's mines.

Judging by the effect of the motion put before the House of Commons by Rear-Admiral Sir Reginald Hall in the course of the debate on the Navy Estimates on March 16th, one would be justified in feeling that here also was a product of H.M.S. *Vernon* if one had not known already that the gallant Admiral was in fact the highly efficient chief of the Naval Intelligence Department during the War.

The motion in question reads: "That in the opinion of this House the Naval Air Services should be put under the control of the Board of Admiralty for the full development of the efficiency of these services and for their better co-operation with the Navy, and for the most economical administration and expenditure."

Obviously if such a motion had expressed the opinion of the House the Air Ministry would have been blown sky high and the Royal Air Force would have been dis-integrated into small pieces, parts of which might have been accumulated for their own purposes by the Navy and the Army respectively. As it was the motion had about as much effect as a damp squib.

To change the metaphor from that of a mine to that of a gun, one might say that the second gun in the Navy's great attack on the Royal Air Force was about as effective as the average of the Navy's shooting during the War. If any portion of Admiral Hall's salvo reached the mark at all it merely bumped with a dull, a very dull, thud indeed into the carefully prepared armour of Mr. Chamberlain's official defence of the Air Force.

### Unintentional Humour.

In elaborating his theme Admiral Hall succeeded admirably in being funny without being vulgar. Arguing that in case of War the carriage of trade and troops at sea will be done by surface ships, he admitted that since the introduction of the air weapon assistance by and defence for aircraft would have to be added to that already provided by Naval men against surface vessels, submarines, and mines. "But this

does not mean that the air should act separately against the enemy air forces, any more than on the introduction of the submarine that the submarine should act separately."

Obviously this is a case of false analogy. The submarine is purely a sea weapon and must be operated by people with Naval training. Aircraft, operating in a different element and calling for tactics and handling of quite a different nature do not in the least come into the same category.

In fact Admiral Hall carried his own condemnation in the phrase, "Defence has to be provided by Naval men." When one considers that from the beginning to the end of the War the Navy showed its utter incapability to organise either attack or defence, except along lines developed somewhere in the days before Nelson, one can see the fallacy of his argument.

Futile Naval strategy lost big ships in the North Sea when there should have been nothing but flotilla work in that area. Futile Naval tactics failed in every direction. The Navy proper failed to provide anything like efficient defence for trade or troops conveyed under their care. Practically every convoy under Naval charge lost ships and the submarine menace was only mastered when the tactics of sea-going aircraft were developed by the sea-going branch of the Royal Air Force under the Air Ministry.

Perhaps the most humorous incident of all in connection with the history of Naval defence during the War is the invention of the Paravane, the one thing which did save our warships and merchant vessels from German mines. This highly efficient instrument was actually developed by a Naval officer out of his previous experience in aviation, and the original paravanes were actually made out of aircraft material then in the possession of the Bristol Aeroplane Company and produced in about the year 1913. Surely the failure of the Navy to protect itself and vessels placed in its charge during the War is the best possible reason for placing the protection of sea-going craft in future wars in the hands of the Royal Air Force.

Furthermore Admiral Hall remarked that if there are two separate Services the authorities of which will develop their own theories we shall have two sets of people studying the problems of invasion in watertight compartments. That of course is the purely Naval view. Surely the best way of assuring this Country against invasion is to have as many people as possible studying the subject. The Navy failed to protect us adequately in the recent War, therefore surely the newer and more intelligent Force should be trusted with the job in future wars.

Another unintentionally humorous observation of Admiral Hall's was that there would be two sets of strategic ideas governing the actions of the Forces on a common fighting ground. It is really quite quaint to hear it suggested that the Navy can have any strategic ideas after its performances between 1914 and 1918.

The limitations of even the most intelligent Naval intelligence is shown by Admiral Hall's remark that in the case of the Army and the Navy there is a clear division of interests between the sea and the land, and each Service is the servant of the other at various well understood points. He argued that "no such division is practicable in the case of the sea and the air working in combination to maintain control of a given water area for a prolonged period."

One thing that was clearly shown in the War was that even when the Royal Naval Air Service was distinctly part of the Navy there was no possibility of working in conjunction to maintain control of a given water area. The R.N.A.S. did its best but it was consistently ignored and despised by the Navy, consequently it had to develop entirely along its own tactical lines and although it ultimately achieved success it owed no thanks to the Navy for that fact.

Perhaps Admiral Hall's best effort was the amazing statement that if the Air Force undertake the defence of trade (by sea) they will have to start at the beginning where the Navy began. To some extent Admiral Hall is right, for Heaven forbid that the Air Force should attempt to continue

at all the Navy's method in their alleged protection of our seaborne trade. Happily however the Air Force already knows considerably more about work of this kind than the Navy is ever likely to learn.

Casting back into ancient history Admiral Hall recalled the very fine work of the Royal Naval Air Service and said that he had a lively recollection of the way in which they supplied the best machines and how they secured the best engines and the best personnel. One quite agrees that the Navy had the best aeroplanes and engines at the outbreak of War, though certainly the personnel of the R.N.A.S. did not compare (except in personal gallantry) with the personnel of the Royal Flying Corps. But Admiral Hall neglected to remark that the excellence of the R.N.A.S. at the beginning of the War was due to the personal help of Mr. Churchill in the face of rabid opposition not only in the Admiralty but in the Fleet.

### The Origin of the Independent Air Force.

From Mr. Churchill left the Admiralty the R.N.A.S. fell into deeper disfavour. Before the Air Ministry came into existence it was for all intents and purposes ignored by the Navy itself. The result was that in order to justify its existence the Air Department at the Admiralty had practically to start in business on its own account as an independent air force.

It was the Air Department of the Admiralty which paid for the building and developed the tactics of the big twin-engined Handley Page bombing machines. It was the Air Department which in 1916 started independent air operations under Captain Elder on the Eastern frontier of France against the Rhine towns, operating from Luxeuil close to the very aerodromes from which Sir Hugh Trenchard's Independent Force, R.A.F., afterwards operated.

It was the Air Department which developed the strategic scheme of bombing the German base aerodromes in Belgium from which the raids on London used to start. It was the Air Department which organised the crack Squadrons of single-seat fighting machines which after clearing the air on the Belgian front did so much to protect the slow observation and reconnaissance machines of the R.F.C. which were co-operating with the Army.

In fact it was the Air Department at the Admiralty and the Royal Naval Air Service, cast forth with continuity from the Navy, which did in 1916-1917 the work of an independent air force such as will be done by the Royal Air Force in the next War. That is to say, they did not co-operate with the Army or with the Navy. They carried on an entirely separate air war which affected the general strategy of the whole war just as before the existence of aircraft the operations of the Navy or Army affected one another in the strategic schemes of earlier wars.

Thus Admiral Hall may console himself with the idea that undoubtedly as the result of their own stupidity the Admiralty and the Fleet between them brought into being the Royal Air Force which to-day the Admiralty is so anxious to break up because the Navy knows in its heart that henceforth it is no longer the first line of defence of the British Empire and will soon cease to be the spoilt pet of the British Public.

Perhaps the most futile of all Admiral Hall's arguments was that we should not have a separate Air Force because he does not know of any foreign Nation which has a separate Air Force. He might just as well argue that we ought not to have a Fleet because he does not know that Switzerland has a Fleet. Surely the fact that the British Empire has not only a separate Air Force but a separate Air Ministry is the best possible intimation that we are still the leader among the nations of the World.

### More False Analogy.

Turning then to matters of personnel, one of Admiral Hall's amusing arguments was that the Navy ought to have an Air Force because it has large barracks which are half empty and Staff Colleges at Greenwich which would bear filling up. Judging by what one knows of Naval Barracks and Naval staff work one would be inclined to advance this as the best possible argument against letting the Navy have anything to do with an Air Force.

After that Admiral Hall turned to the old argument that if the Navy had its own Air Service officers would specialise in the air as they do in submarines, and that officers actually in the Navy should specialise in air. Furthermore he said: "Perhaps when the attractions of flight are not so great, or age creeps on them, they can give up active service in the air and return as specialists, become staff officers in air, and eventually Admirals who know something about the air."

Of course this is quite an old argument but people who use it quite forget that in these days a man can go on flying till long after the age at which he is likely to be required to fly. In fact even during the War men had to be promoted to non-flying commands at ages when they still wanted

to fly. One of the greatest difficulties at that time was to prevent certain Brigade Commanders and Wing Commanders and Squadron Commanders from going out and having private fights over the lines when they ought to be attending to the administration or operations of their commands.

Under present conditions a man can go on flying until he has to leave because at a certain age he has not attained a certain rank. They do not retain Sub-Lieutenants of 40 in the Navy or Subalterns of 40 in the Army. Consequently people will retire from the R.A.F., not because they are too old to fly but because they are too old for their rank and for such as are incapacitated physically from flying there will be plenty of useful jobs on the ground if they have the intellect to do the work which these jobs require.

Admiral Hall said that at sea they had an expression which for years he had always believed, and still believed, to be true, namely, "A seaman first; a specialist afterwards." That false doctrine, one believes, is largely responsible for the inefficiency of the Navy in the late lamented War. Instead of training specialists as specialists and regarding the ship merely as a movable fort or barrack which exists for the conveyance of the specialist gunner or torpedo man or what not, the Navy tries to make its specialists seamen first and specialists afterwards, and so absolutely destroys their efficiency. And that is just what would happen to the Naval aviator.

The idea that a man can become a competent seagoing aviator and then return to ordinary watch-keeping on board ship is utterly absurd. Admitting that there is a great deal to learn in handling a ship even without being a specialist there is far more to learn in air war, and if the Navy thinks that it can train men to be competent aviators in a short time and that at the end of it they will still remain competent Naval Officers, then it truly deserves the type of aviator it would get under such a system of training; though as a matter of fact aviators produced in such a manner would probably maintain quite adequately the intellectual level of the average Naval Officer.

### The True Solution.

The true solution of the Naval Aviation question is that the aircraft-carriers should belong to the R.A.F., with all that in them is. The handling of the ships could be done by R.A.F. personnel specially engaged or enlisted from the Mercantile Marine, who are as a rule better seamen than the regular Navy as they do so much more seagoing.

These ships should be told off to co-operate with the Fleet when necessary—just as R.A.F. squadrons or wings are told off to co-operate with the Army—except when the Fleet is told off to operate under the orders of the R.A.F. Then we should at any rate have efficient air work, even if the Fleet failed owing to defective staff work.

### The Supporting Attack.

Viscount Curzon, who seconded the amendment, lamented that there was not a solitary word in the Estimates about the employment of aircraft at sea. Even aircraft carriers were not specifically mentioned in the explanatory memorandums. This, one may remark, may be taken as an excellent gauge of the mental attitude of the average Naval man towards aviation.

He said that he knew the Admiralty were profoundly impressed by the enormous strides made by aircraft. The Admiralty had no control or responsibility for any of the aircraft on their carrier ships or for the personnel working them. The Air Ministry could withdraw pilots or observers and send them to another corner of the globe. He mentioned the famous mistake of the Personnel Department R.A.F. in withdrawing the only squadron of experienced deck-flying pilots and sending them to Iraq. One suggests that as the Personnel Dept. R.A.F. was under an Admiral at the time surely this is an excellent example of the incompetence of Admirals in handling air personnel.

Viscount Curzon, who is evidently seized of the situation, acknowledged that the increased use of aircraft at sea may possibly lead to a very great economy of Naval power. A Naval scouting group consisted as a rule of a squadron of light cruisers, anything up to six. In future a scouting group might consist of three light cruisers with an aircraft carrier. One would like to point out here that one aircraft carrier with half a dozen aeroplanes could do as much scouting as half a dozen groups of light cruisers.

He apparently feared that the Air Ministry might refuse to grant aircraft for such work. He argued that the six and a half Squadrons of R.A.F. which were working for the Navy in 1921 could not be found in this year's arrangements. Further he said that "those who care for the Navy are all anxious to have a reduction of the Air Force to meet the present situation." One doubts whether even Naval officers are so foolish as that, and one is inclined to think that the sentence quoted must be due to an error of Hansard's.

He said that they (the Navy faction) thought that the present situation did not lead to the efficient or best use of air-



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craft from the point of view of the Navy, and he thought that an impartial enquiry should be set up to assure the country or to make recommendations with regard to the present status of aircraft so far as the Navy is concerned, and he dared say that the same question rose in regard to the Army.

It appears that Viscount Curzon voices very accurately the feeling of the Navy, which is that if the Royal Air Force is developed on the right lines the Navy will lose most of its job and will therefore be relegated to its proper position, namely that of water police in parts of the World where aircraft are not necessary and a species of transport service for the Army and Air Force.

That ended the Navy's attack, the two speeches being about as effective as the discharge of a double-barrelled shotgun against a fortified position.

### The Government Reply.

The Government reply was delivered by Mr. Chamberlain as Leader of the House, and therefore deputising for the Premier. As he explained himself, the reply should properly have been made by the representative of the Admiralty but this particular question could not be confined to a single Service. Therefore presumably neither Capt. Guest nor Mr. Amery could reply.

Mr. Chamberlain said:—"It seems proper that the statement of Government policy should be made by a Minister, not the head of one of these various Departments but on behalf of the Government as a whole. It is certainly due to no lack of respect to other Gentlemen who intend to speak, but I think it is for the convenience of the House that I should take the earliest opportunity of stating what our views are.

"I do not pretend to-night to lay down a policy for all time. The Air Arm has had, during and since the War, an extraordinarily rapid development, but he would be a bold man who would attempt as yet to define the ultimate potentialities of the Air Force or the place which it will hold in warfare whether over the sea or over the land. I can imagine without an undue strain upon my imagination developments which may change the whole course of war and which may quite conceivably lead the World in a short time to think that limitations of battleships or limitations of armaments is of very little use unless the new weapon is subjected to limitation of a similar kind.

"Accordingly in what I say I am declaring the policy of His Majesty's Government as things stand, and it is essential that that policy should be known because it is not fair to any Service, nor can the best be expected from any Service, unless they know clearly what our present policy is.

### The Rebuke Courteous.

"I think my hon. and gallant Friends who have moved and seconded the Amendment have said everything which could be said in support of their Amendment from the particular point of view from which they approach the question. It was essentially and admittedly a rather narrow point of view. They were considering the interests of the Naval Service, even to such a point that my hon. and gallant Friend at one point in his speech made the point that it was not fair to take enterprising officers, or officers of ability, from the Naval Service for the service of the country in another sphere.

"I must remind my hon. and gallant Friend of what indeed he will readily admit, that we have a common country and that all these Services exist and only exist for the defence of that common country. We must look at it therefore from a wider point of view than that taken by my hon. and gallant Friend."

### An Historical Interlude.

Thereupon Mr. Chamberlain gave a very fairly accurate description of the development of the Flying Services up to the formation of the Air Ministry, and remarked:—

"It will be seen that it was War experience which led to the creation of the Air Ministry and to the constitution of a separate homogeneous Air Force. It was not theory derived from speculation in the past, but it was practical experience, after trying a great many other experiments, and the deficiencies which they left, which proved to the Government in the pressure of the War, and for the successful conduct of the War, the necessity of creating the system now in force."

He pointed out that it was only after the Air Ministry was constituted with its air staff that the aeronautical aspects of the War were considered from an air point of view. Until that time the air was under purely Naval or Military command and was only thought of in terms of Naval or Military warfare.

It is rather a pity that somebody did not suggest to Mr. Chamberlain before he made his speech that as already pointed out, the rejected R.N.A.S. had been thinking from "a distinctly air point of view" from 1916 onwards.

### A Safeguard for the R.A.F.

Mr. Chamberlain recalled that Mr. Churchill had recently given the House some very interesting information as to the success of the Air Force as an independent striking force in Mesopotamia and Somaliland and said, "The Government believe that if the Air Service were reabsorbed by the Navy and the Army, this aspect of the service to be rendered by the Air Force would inevitably be relegated to the background. Sailors and soldiers would continue to think of the force in terms of their own service and would not pursue and could not be expected to pursue its development as an independent force outside the purpose with which it was associated, and for which they desired that it should be employed.

"Believing as we do, however, that the Air Forces have immense potentialities of their own, and in their own element, distinctive from their other and vitally important duties in connection with the Naval and Military Services, the great importance of which is not in the least underrated, and convinced as we are in the future that the greatest danger to this country may well be from the action of air forces rather than naval or military forces we consider that it would be a retrograde step at this time to abolish the Air Ministry and to reabsorb the Air Service into the Admiralty and War Office."

As to the argument that other nations had not yet a separate Air Force, Mr. Chamberlain said that more than one great Power is most anxiously canvassing the whole situation and that it was not unlikely that we should find our example followed.

One can speak with some personal knowledge on this subject and one is prepared to bet that inside five years three or four other Powers will have formed a separate Air Service and that the first of them will be the United States.

### The Charter Itself.

Mr. Chamberlain then made the following statement which one may fairly call the Magna Charta of the Air Force:—

"These are the conclusions at which we have arrived:—

"In the first place that the Air Force must be autonomous in matters of administration and education.

"Second, that in the case of defence against air raids the Army and Navy must play a secondary rôle.

"Third, that in the case of military operations by land or naval operations by sea, the Air Force must be in strict subordination to the general or admiral in supreme command.

"Fourth, that in other cases, such as the protection of commerce and attacks on enemy harbours and inland towns, the relations between the Air Force and the other Services shall be regarded rather as a matter of co-operation than of the strict subordination which is necessary when aeroplanes are acting merely as auxiliaries to other arms.

"Lastly, the Government have decided to appoint a Committee which will, I say without hesitation, consist either of the Standing Committee or the Sub-Committee of the Committee of Imperial Defence, to examine carefully into the system of naval and air co-operation and to advise us how we can best secure that the Air Force should be enabled to render to the Navy, and in connection with the Navy other services, the aid that they may require." (Thus Hansard.)

### The "First Line" At Last.

This means definitely that the Royal Air Force becomes henceforth our First Line of Defence, for obviously the only possible means of attack on this country is by air. When the R.A.F. has been adequately equipped a few years hence the Fleet can be reduced till its personnel is merely sufficient to act as transport operators for the Army and Air Force, for then the R.A.F. will be quite competent to deal with all attacks.

Even under the existing circumstances the R.A.F. is more competent to do this than was the Navy. Therefore it may be as well to point out here a fact which has not been made public hitherto, namely that the whole budget for the Royal Air Force barely equals the cost of two capital ships under present conditions.

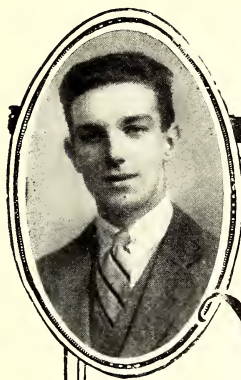
The machines of a properly organised R.A.F. coast defence station, one Squadron Leader's command, would be capable of abolishing the two battle ships which cost as much as the whole of the R.A.F. As a matter of fact, a Squadron Leader's command of torpedo-planes would probably be capable of abolishing the whole Fleet. So there is a great deal to be said for the remark recently made in political circles to the effect that "one Squadron Leader in the R.A.F. is equal to seven Admirals," at any rate as a coast defence commander.

### As Regards the Army.

Mr. Chamberlain in his concluding remarks said that he had not thought at the present time there was likely to be need for any further inquiry as regards the co-operation of the R.A.F. and the Army.

He said that the R.A.F. would be responsible for defending Naval Depots and dockyards against enemy aircraft: that

(Continued on page 215.)



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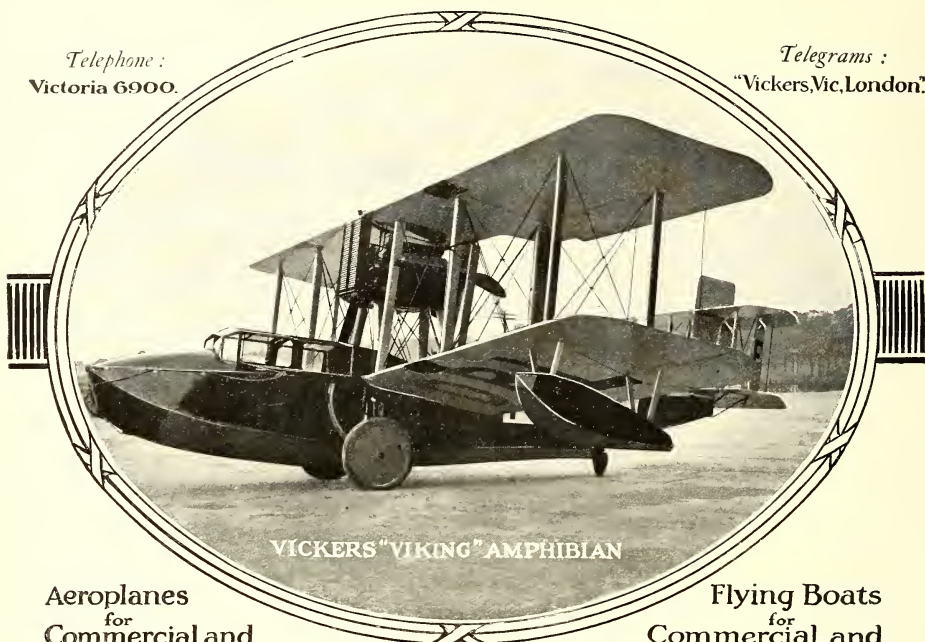


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### THE WEEKLY COMMENTARY.

In the sixth instalment of the articles on "The Commercial Aeroplane" an attempt is made to suggest the form which it might be profitable to give to an aeroplane if one were seeking the highest possible aerodynamic efficiency.

The general aspect of such a machine is shown by a diagram and it will be seen that this particular form involves no startling departures from fairly well proved practice.

It is suggested, however, that it may be found that

such details as the necessity for adequate engine cooling and the provision of a good view for the pilot may introduce serious difficulties in the realisation of the possible advantages of this particular shape of aircraft.

The present issue contains a further instalment of the series of Practical Hints on Aircraft Instruments. The instruments dealt with are indicating and recording altimeters and barographs.

### THE COMMERCIAL AEROPLANE.

By W. H. SAYERS.

#### VI. A Possible Type of Economical Aeroplane.

Having considered the manifold shortcomings of present types of aeroplanes, one may now consider what sort of shape one would expect the ideal aeroplane to be. Purely with a view to aerodynamic efficiency it seems fairly obvious that it should be a monoplane, and devoid of external wing bracing, and that generally it should be built more or less on the Woyewodski principle of grading wing into body.

Inevitably this means a very great chord and a very great depth of wing at the centre, and therefore room for deep spars where great bending moments call for such depth.

A reasonably high aspect ratio will be essential for efficiency, and to attain this, on a reasonable span with a great chord at the centre, a great taper in chord will be necessary towards the tips. Even without tapered chord bending moments decrease towards the tip of the wing so rapidly that a reduced spar depth is allowable as the tip is approached, and with a tapered chord this effect will be exaggerated, and therefore the camber of the section can be reduced towards the tip.

#### CHARACTERISTICS OF THICK TAPERED WINGS.

Generally speaking wings of increased camber develop their best  $L/D$  ratio at increasing values of the lift coefficient, and for maximum efficiency it is necessary that the whole of the wing shall work at its best angle at the same time. It is not by any means necessarily the case that this means that each section of the tapered wing will develop its best  $L/D$  at the angle of best  $L/D$  for a wing uniformly of that section, but there exists a fair amount of evidence that for such a tapered wing to develop its best overall efficiency the component sections shall decrease in angle of attack, and in loading per square foot of surface, from centre to tip. This fact has two important results. Firstly, it accentuates the effect of tapering chord in reducing the bending moment in the spars, and concentrating stresses of high value to near to the centre line of the wing—a factor which aids greatly in keeping the structure weight low.

Secondly, if these conditions coincide with a marked sweep back in the wings, there is a general tendency for such a wing to become inherently stable. If experience shows that stabilising in the orthodox way by a separate tail plane is inconsistent with the development of an efficient system of air flow round the machine as a whole, it may be possible to dispense with a tail plane and stabilise the wings in this manner.

In any case it is worth while using this quality to reduce the size of tail plane which would otherwise be necessary for stabilising purposes, and thus reduce the risk of unnecessary additional resistance.

#### POSSIBLE SCALE EFFECTS.

There is the further fact that evidence does exist that tapered and "washed out" wings of this type may develop unusually high lifts and abnormally high  $L/D$  ratios in actual service despite the fact that model tests do not show any evidence of

this effect, and that the recognised authorities on aerodynamics will not admit that the effect can occur.

Very great care will probably be necessary in the design of the sections close to the centre line of the machine, so that no sudden and disturbing changes of section, leading to sudden changes in the form of the streamlines in the vicinity, may occur. Fig. 1 shows the type of shape to which such considerations would lead one. The upper part of the figure is a contour map, so to speak, of wing and body in side elevation, each "contour" being a section on one of the lines AA to DD of the corresponding plan view below. In this sketch sweep-back and wash-out have been neglected as their inclusion would tend to confuse the contours.

Embodying some sweep-back on the wings, and adopting an otherwise normal arrangement one would produce a complete machine somewhat on the lines of Fig. 2, which is merely the wing of Fig. 1 with the addition of an undercarriage, and a tail. Both these would be faired into the "body" with proper precautions as to contours, so that all sections merge smoothly one into another.

#### A PROBLEM IN COOLING.

The engine would naturally be entirely enclosed and here one will meet at once a somewhat important problem, for that engine will need cooling. It seems practically certain

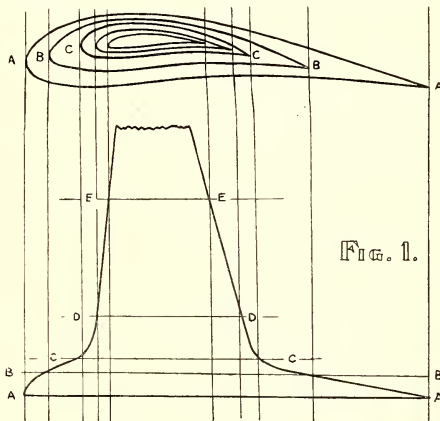


FIG. 1.

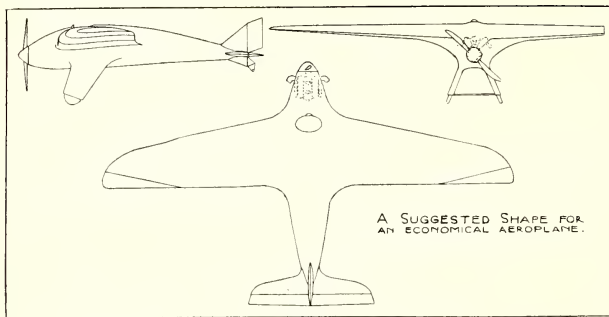


Fig. 2.—This figure shows the kind of shape that might reasonably be expected to produce an aeroplane of very high efficiency. The wings and body are contoured one into the other on the lines indicated by Fig. 1.

Such unavoidable excrescences as undercarriage and tail are also contoured into the body as far as is possible.

The draughtsman who made the original sketch has sought to give an air of verisimilitude by showing an arrangement of exhaust pipes which would certainly not be used on such a machine.

[Perhaps the exhaust might be emitted from the tail and thus give a medium of jet-propulsion.—E.L.]

that it will be no use to take all the trouble involved in contouring wings, body, undercarriage and tail to the extent suggested and then to stick on any normal type of radiator. It is possible that radiators, somewhat of Lambdin type, might be suspended between the undercarriage legs without producing serious disturbance to the general flow round the machine. At the very best such an arrangement would lead to the development of the full resistance of those radiators and that resistance would be appreciable.

There is some reason to believe that it is impossible to obtain a high rate of heat transfer per unit of radiator surface with any arrangement which does not cause disturbed airflow. If an aeroplane of the type here suggested proves to have qualities of the type hoped for, no arrangement which produces disturbed airflow can be tolerated as part of the machine.

There is, however, no reason why a sufficiently large part of the surfaces otherwise necessary to the machine need not serve for cooling purposes. Judging from the German Junker machine it may be possible to corrugate some of the body or wing surface longitudinally without appreciable added resistance, and it may be possible to build a radiator in the form of a very shallow annular tank, surrounding part of the body—whose outer radiating surface shall conform to the body lines. Alternatively one may use part of the wing surface for cooling, covering the necessary area with a double metallic skin, the cooling water flowing between the two surfaces.

Very certainly no such abomination as a nose radiator of the usual type would be compatible with the kind of improvement which it is hoped may be found possible.

#### THE POSSIBLE EFFECT OF A TRACTOR SCREW.

Assuming that it is possible to build a machine on some such lines as those suggested, which shall have, as a glider, an  $L/D$  ratio in the neighbourhood of 20/1, what is likely to be the effect on its characteristics of the disturbances caused by a tractor airscrew? It is of no use to argue that as a tractor airscrew does not seriously upset the performance of present types it will not upset that of the suggested type. It is just possible that it will not; it is quite probable that such a high efficiency as is being sought cannot be obtained in the wake of an airscrew.

Here again one will need to experiment. Possibly a single central airscrew will be found inadmissible, and twin airscrews of opposite rotation one on each wing may be necessary. Possibly even the tractor type may have to be abandoned, but before that can be decided it will be necessary to experiment, first with a machine of the type without an engine—that is to say a glider—and thereafter as a power-driven machine.

#### THE PILOT'S HEAD.

A number of other points of detail arise. Will cutting a large hole through which the pilot's head may protrude spoil the performance of such a machine? It may; if it does it seems quite possible that for this reason alone the single tractor type of machine will have to be abandoned.

There is only one place where the pilot can be placed so that he is entirely within the machine and yet can see properly, and that is in the extreme nose of the machine. That, of course, is on the assumption that no special projecting shield can be built round him, which shall not seriously increase the resistance of the whole machine. But the pilot cannot be in the nose when that nose is already occupied by the engine and airscrew. Either a twin engine, or a pusher airscrew arrangement would solve that difficulty.

Thus, even if the general run of the assumptions here made as to the probable correct form of complete aeroplane are sound aerodynamically, there are numerous possible sources

of trouble which may render it impossible to realise the high efficiency of such a machine in practice.

But it is definitely put forward that some such form of aeroplane is worth careful test and experimentation.

#### THE POSSIBLE PERFORMANCE OF THE PROPOSED TYPE.

On the basis of existing model results it would seem to be possible to reach a maximum  $L/D$  ratio of 17 or 18 to 1 with such a shape, and to obtain a very reasonably high maximum lift, without allowing for the possibility of large "scale corrections."

On the basis of such figures a few estimates of what might be achieved in this way have already been worked out. A machine of 42 ft. span, about 22 ft. long overall, with a 7 ft. chord tapering to 3 ft. nearly at the tip, and with a wing surface (not counting "body") of about 220 sq. ft., could certainly—if model wing tests can be applied in the usual manner—be loaded to 12 lbs. per sq. ft. without reaching an unduly high landing speed. That is a total weight of 2,640 lbs.

From fairly safe assumptions as to the distribution of loads over wings of such a form stress calculations indicate that it is possible to build the wings for such a machine for a very low weight. The actual depth available for spars at the wing roots reaches a figure comparable to that between top and bottom spans of a biplane, and the tapering depth of spars outwards conforms to the reduction in loading and actually allows for a more economical distribution of spar material there is possible with the uniform girder depth of the biplane.

Very certainly it would be possible to build a properly proportioned machine of this type and size with a structure weight not more than one third of the total weight. Very probably it would be found that there would be no difficulty in getting down to one quarter of the total. Taking the higher figure this means 883 lbs.

Ordinary assumptions of aeroplane design indicate that the type of wing proposed for this machine loaded as stated would have a most efficient speed of about 100 m.p.h. and suggest 17 to 1 as the probable  $L/D$  ratio. It is distinctly possible that the whole machine might prove to be as good as the model wings alone.

This would mean that 42 thrust-horse-power was needed for level flight. The minimum thrust-horse-power needed for flight at about 65 m.p.h. would be about 32, and a 100 h.p. engine with a reasonably efficient airscrew would give a climb of between 4 and 500 ft. per minute, and a ceiling of over 10,000 ft.

There are no really light engines of so low a power and it will be safe to allow 6 lbs. per h.p. as the probable weight of engine installation. Taking fuel 3 hours cruising at 1½ lbs. per h.p. installed, this means 750 lbs. for engine and fuel, which added to the structure weight gives an unloaded total of 1,630 lbs. There would therefore be a margin of 1,000 lbs. for load, or at the rate of 10 lbs. per h.p. installed. It is certainly worth while to experiment in a direction which holds out such possibilities even when it is obvious that one is likely to encounter numerous practical difficulties in the course of such an experiment.

For obviously the machine would be justified if experience showed it to be appreciably less efficient than these figures suggest that it might be. Alternatively, if it is found possible to make the machine aerodynamically as good as the figures given suggest, the margin of disposable weight which is available will give a pretty large margin for the extra weight of the large surface radiators which may be needed, or for installing gear-drives which would allow the pilot to be totally enclosed in the body with the engines and airscrews in a position which would not spoil his view forward.



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## PRACTICAL HINTS ON AIRCRAFT INSTRUMENTS.

By A. W. HULBERT.

## NO. 3.—ALTIMETERS AND OTHER HEIGHT RECORDERS.

As regards the principle of working, the altimeter is perhaps the least understood of any of the range of instruments on the dash-board of a modern aeroplane, it being looked upon more or less as a "box of tricks," and seldom tampered with.

In reality its action is extremely simple and easily understood by an average person. It consists of a small metal box on diaphragm, from which the air has been exhausted, connected by suitable levers and chains to the pointer, travelling over a scale marked in thousands of feet. On the machine climbing the atmospheric pressure decreases, allowing the vacuum box to expand, moving the pointer over a portion of the scale in proportion to the height at which the machine is flying. Zero adjustment is obtained by rotating the knurled button at the base of the scale, to allow for variation in height of the aerodrome above sea-level.

Altimeters should be tested once every two months or sooner if any bad landings have been made.

The testing plant consists of a glass bell-jar mounted on a metal base and connected to a vacuum pump and mercury column. The altimeter under test is placed under the bell-jar, the air being gradually exhausted by means of the vacuum pump. The various readings of the altimeter are compared with the position of the mercury column and checked by means of the figures given below.

Reading of Altimeter in thousands of feet.	Corresponding reading in inches of mercury.
1,000 .....	28.87
2,000 .....	27.76
3,000 .....	26.77
4,000 .....	25.8
5,000 .....	24.8
6,000 .....	23.9
7,000 .....	23.1
8,000 .....	22.2
9,000 .....	21.4
10,000 .....	20.69
11,000 .....	19.9
12,000 .....	19.2
13,000 .....	18.8
14,000 .....	17.3
15,000 .....	17.2
16,000 .....	15.5
17,000 .....	15.0
18,000 .....	15.4
19,000 .....	14.8
20,000 .....	14.3
21,000 .....	13.8
22,000 .....	13.3
23,000 .....	12.8
24,000 .....	12.3
25,000 .....	11.9
26,000 .....	11.4
27,000 .....	11.07
28,000 .....	10.6
29,000 .....	10.2
30,000 .....	9.6

The altimeter should be tested both up and down the scale, that is to say after being tested from 0 feet on ground level up to 20,000 feet or 30,000 feet the air should be allowed to enter slowly by opening the release cock slightly on the vacuum pump and checking the instrument as the pointer goes back to zero.

With regard to adjustment of the altimeter; it being a pressure operated instrument naturally a change in the weather, or rather of barometric conditions, will cause the altimeter to read above or below the zero on the scale. For this reason the scales of aero altimeters are made movable to enable them to be reset to zero before starting on a flight. The front bezel of the instrument should be removed occasionally and the movable scale and the pinion on the knurled bottom cleaned and any metal filing removed. These will collect if there is too much play between the pinion and the teeth cut around the edge of the scale, causing the teeth to wear away with constant use.

The final point to watch when testing altimeters is the "lag" on the time it takes for the instrument to return to zero. If the time is excessive it shows considerable friction in the movement and the instrument should be returned to the makers for cleaning and adjustment.

## NO. 4.—RECORDING ALTIMETERS AND BAROGRAPHS.

Both these instruments are practically identical in operation with the altimeter dealt with in the previous article, with

the addition that they are fitted with a chart, driven by clockwork, which enables a permanent record to be kept of any flight or climbing test. The charts are graduated vertically in thousands of feet and horizontally in hours and minutes.

It is particularly important that recording altimeters be fitted in the machine in such a way as to be free from vibration and this can best be done by slinging them by means of rubber cord. Unless this is done the pen will vibrate and blot the chart.

Another trouble experienced with recording instruments of this kind is friction between the paper and the pen. If the pen is observed to work in a jerky fashion it indicates that the paper is of poor quality, causing the pen to scrape instead of gliding easily over the paper. Again, jerky lines on the chart may indicate friction in the mechanism, and this should be carefully gone over to make sure that it is working perfectly freely but without undue play in any part.

A special brand of ink is manufactured for use with recording instruments and should always be used; ordinary ink causes the pen to choke up and corrode.

Friction, as mentioned above, is the one great thing to guard against in recording altimeters, and this can sometimes be traced to the pen itself having too sharp a point. This should be very slightly rounded with a watchmaker's file to ensure it gliding easily over the chart. The amount of pressure with which the pen presses on the paper should also be reduced to a minimum and the adjusting screw on the pen-arm should be set so that the pen just touches the chart and no more.

Recording altimeters and barographs should be checked occasionally by means of a mercury column as previously explained in the notes on altimeters. Here any friction in the movement will be revealed when the vacuum pump is operated and the pen arm made to travel over the whole range of the chart.

A trouble which is sometimes experienced is back-lash between the clock mechanism and the drum upon which the chart is mounted. Sometimes this fault is in the design of the instrument but in other cases a general run over the drum mounting will put matters right.

Barographs are practically identical in construction and operation with recording altimeters and the same hints regarding adjustment apply equally in both cases. The Barograph chart is graduated in millibars and/or inches of mercury instead of thousands of feet, as in the case of recording altimeters. The clockwork also is arranged to revolve the chart once in seven days, instead of six or twelve hours which is the usual time period for recording altimeters.

A completed chart at the end of seven days presents a record of every variation in pressure, no matter how slight, at any period of the week.

The barograph is chiefly used where a close study of meteorological conditions is necessary, and a study of the chart will materially assist at arriving at an accurate forecast of impending weather conditions. The following signs should be looked for when taking readings:

Rapid fall .....	Storms and rain; gales.
Rapid rise .....	Clear weather with high winds.
Gradual rise .....	Usually fine weather.
Steadiness .....	Fine weather.
Steady fall .....	Wet or unsettled weather.

## THE X-RAY INSPECTION OF AIRCRAFT MATERIAL.

On Thursday, March 16th, Dr. V. E. Pullin, Director of Radiological Research at the Royal Arsenal, Woolwich, lectured to the Royal Aeronautical Society on Radiological Inspection. After a brief account of the organisation of the Radiological Research Department, Dr. Pullin showed a large number of X-ray photographs indicating the possible uses of this method of inspection.

With the type of plant now developed by his Department Dr. Pullin showed that it was possible to detect interior flaws in steel or other dense metals up to three inches in thickness, to recognise porosity in aluminium castings, to discern worm holes in wood, and many other faults not otherwise discoverable except by a process of dissection, and he suggested that the method might be of very great value for aircraft inspection.

The general opinion of speakers in the discussion was, however, somewhat adverse. Generally it was felt that the interpretation of X-ray photographs offered serious difficulties, and that, until the technique of radiology was more fully developed, the method could scarcely be considered of practical value.

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## SOME OFFICIAL PUBLICATIONS.

The Director of Publications, H.M. Stationery Office, has sent to *THE AEROPLANE* for review three recent reports of the Aeronautical Research Committee. In the past he has similarly forwarded at least one other such report.

It is well known that in the series of R and M, as they are commonly called, issued by this Committee and by its predecessor the Advisory Committee for Aeronautics, there is much information of a type both useful and interesting to the practical aeronautical engineer.

In the selection now sent for review it is difficult to find any such interest or value.

No. 675, dated January, 1920, is most nearly of direct interest. It is entitled "Experiments in Rigid Airship R.29" and is by the late J. R. Pennell and A. H. Bell. It consists of a record of turning trials, acceleration trials, tests of airspeed with various engine combination attempts, and thrust measurements and of the air-speed at various distances from the hull. The only part of the tests which is of real value is that dealing with acceleration, as from these tests the resistance of the ship at various speeds may be deduced. Within the range of the tests the resistance coefficient does not appear to change with speed, an irregularity which is sometimes in one direction and sometimes in another being obviously due to some extraneous disturbance. In the absence of model tests of this particular shape of airship these trials however do not give any conclusive evidence on the vexed subject of "scale corrections."

As R.29 was obsolete even when the tests were made the other results are of academic interest only.

The two remaining reports in this selection consist of No. 684, "The Acoustics of Moving Sources with Application to Airscrews," by Professor G. H. Bryan, is a mathematical investigation bearing upon the cause of certain curious noises produced by airscrews. It is almost certainly of interest to the mathematical physicist, and such investigations undoubtedly have a very real value, in that they represent efforts to extend the theory of aerodynamics to meet the facts of practical experience. The present note, however, is not of any practical engineering value.

The third report, R and M No. 746, is entitled, "Physical Properties of Dope Solvent Mixtures" (continuation of R and M 663), by Guy Barr, B.A., D.Sc., and L. L. Bircumshaw. In the absence of R and M 663 the summary of 746 seems to indicate very fairly the general nature of the latter publication. This summary reads:—

"The curves connecting density, viscosity and surface tension with composition of binary mixtures of acetone with water, ethyl-alcohol, methyl-alcohol, and benzene have been constructed in order to examine the relation between the properties of the mixed liquids and the behaviour of cellulose acetate in those solvents. No obvious connection can be traced."

It is probably desirable that this lack of connection should have been discovered and put on record.

It is suggested, however, that the Director of Publications in his very laudable endeavour to secure publicity for this very important series of technical reports should now exercise care to issue for review some samples of the many reports which are of direct practical value and interest.

Copies of the above reports and of many others of great general interest may be obtained from H.M. Stationery Office, Imperial House, Kingsway, W.C.2. The prices are, R and M 675, 1s. 6d. net, 1s. 7½d. post free; R and M 684, 6d. net, 7d. post free; and R and M 746, 1d. net and 3d. post free.

## SCIENCE STUDENTS AT SMITH'S.

A party of students from the Royal College of Science and Technology paid a visit to the works of S. Smith and Sons on March 13th, in order to see the processes whereby aviation instruments are produced commercially.

Very great interest was taken in the Calibration department, where Air Speed Indicators, Altimeters, Revolution Indicators, Pressure Gauges and Petrol Level Indicators are tested and calibrated. The test overload test of pressure gauges, wherein these instruments are submitted to a pressure of four to three times their maximum reading, was also shown.

An interesting special job in hand at the time of the visit was the test of special instruments for the cabin of certain new Handley Page passenger-carrying machines. These consist of an altimeter, an air speed indicator and a clock mounted as one unit, mounted in polished bezels and with silver faces. These harmonise with the cabin decorations and have a less forbidding appearance than the standard black-faced instruments.

## THE PROPHECIES OF A LATTER-DAY SAMUEL.

It was announced some time ago by Sir Samuel Instone that the Instone Air Line contemplated the operation of a certain number of purely cargo-carrying aircraft as a supplement to their passenger services. Sir Samuel appears to have further unburdened his heart to the *Times*' Aeronautical Correspondent. For on March 17th, that journal publishes an interview wherein Sir Samuel is alleged to have made, among others, the following statements:—

"Two small cargo aeroplanes . . . are nearing completion to our order . . . while the 'keel' has just been laid of a really big one . . . which will carry aerial loads for us to be reckoned not in pounds as hitherto but in tons. . . . The day of the really large practical heavier-than-air flying-ship is in fact on us. . . . Winged aircraft of 50, 100, and even 150 tons are now in design—metal all-weather craft requiring only to go into dock . . . for an occasional overhaul. . . . Soon at ports like Marseilles big air trunks should pick up urgent loads weighing many tons and bring them through to London in a night's flying."

One is at loss to know whether to congratulate Sir Samuel Instone on possessing a degree of faith not usually displayed by his race, or to condole with him on what appears to be the effect of an encounter with the irrepressible "H. H."

## OIL IN TROUBLED ENGINES.

One forgets how long ago it was in the dark ages of motoring when one first met Albert Newton, but even then he was trying to teach the obtuse user and designer of internal combustion engines the importance of using the particular kind of oil which was most suited to his particular engine. Consequently what A. E. Newton does not know about lubricating oils is not of any particular value to anybody. It is therefore quite natural that having spent so many years in this particular business Mr. Newton should ultimately form a firm of his own.

Consequently A. E. Newton Ltd. duly came into existence shortly after the War. Added importance has recently been given to the firm by the fact that Sir Alfred S. Mays-Smith, President of the Society of Motor Manufacturers and Traders, has joined the Board, which consists of Sir Alfreed and Colonel E. Hamilton Gordon, C.M.G., D.S.O., with Mr. Albert Newton as Managing Director.

The particular interest of A. E. Newton Ltd. to the aeronautical community is the fact that after months of careful experiment and practical tests in the air the firm has now produced Newton Aero Oil, which is a scientific combination of castor oil and other oils, for the lubrication of aero engines. The particular virtue of this oil is that it is practically free from carbonaceous deposit. Whatever deposit may be produced is of a soft and easily removable nature. Moreover, the oil enables force-pump pressure to be kept up to an extraordinary degree, which is eminently desirable in this type of engine.

Newton Aero Oil is also recommended for racing cars and motor cycles, where extraordinary strains and stresses have to be endured under racing conditions. Incidentally it will gratify sporting motorists who like to get a little extra pace out of their machines, or like them to smell like racing cars at any rate.

Of course, in addition to the special aero oil, A. E. Newton Ltd. supply a full range of high grade mineral motor oils and made a speciality of supplying the particular type of oil which is most suitable for any particular make of car. Anybody who is really interested in getting the best possible power and service out of their air or road or sea automobiles will do well to write to A. E. Newton Ltd., 13, Victoria Street, S.W.1, and ask for particulars as to what type of oil is most suitable for their particular use.

## LITHUANIAN POSTS AND TELEGRAPHS.

The establishment of an aerial postal service in Lithuania has been commemorated by the issue of special stamps in seven denominations, i.e., 20, 40, 60, 80 skaitas (premiens), and one, two and five aukškins (marks), in quantities of 100,000 for each denomination or to the value of 1,000,000 marks in all, which were put in circulation during July last year.

From November the transmission of correspondence by aeroplane was temporarily suspended. During September last year the State postal, telegraphic, and telephone receipts were 2,677,668 marks, and during October 2,357,527 marks.

## RECEIVERSHIP.

CADOGAN CARRIAGE CO. LTD. (formerly R. G. Toms Aviation and Motor Co. Ltd.).—H. J. de C. Moore, of 2, Gresham Buildings, Guildhall, E.C., ceased to act as receiver or manager on March 6th, 1922.


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## AN APPRECIATION OF THE DH9c.

The following is an extract from a letter recently received from the Compañía Española de Tráfico Aereo—the Spanish aerial transport company which is running the Seville-Larache Air Line:—

"On the occasion of the completion of the first three months during which we have been operating the first Spanish air service between Sevilla and Larache, we should like to take the opportunity to place on record our satisfaction with the material and personnel provided by you. Using these exclusively, you will be pleased to hear that we have, since the inauguration of our service on October 15th, 1921, till January 15th, 1922, successfully completed 85 return journeys. This represents 42,500 kilometres covered without difficulty or mishap and an incalculable saving in time and increase in regularity over the existing means of transport."

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KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



(Continued from page 204.)

the Air Ministry would be the predominant partner in anti-aircraft defence, including anti-aircraft batteries.

The Government did not think that for the present they could consider the question of a Minister of Defence superior to the other three. They did however intend to appoint a Committee to consider amalgamating ancillary services.

### The Benediction.

Finally he said, "To sum up what I have said, the Government believe that to abolish the Air Ministry, to re-absorb the Air Service into the services of the Army and Navy would be a fatally retrograde step. Even if it removed a little friction and improved and facilitated the co-operation between the Air Services and purely naval and military operations, which is very doubtful, it would unquestionably retard the development of the Air Services in their own element, in which it may be that the future of national defence lies. To take this step would be to bring back also all the evils of divided control which existed in this matter in the early part of the War.

"The decision of the Government to establish a separate Air Ministry was based, as I have said, on War experience. What is now required in order to ensure the success of the present scheme is close and intimate co-operation and that the three

Services should regard themselves as the common servants of the nation in endeavouring to attain a single object. This cannot be achieved as long as the existence of the Air Ministry and the Air Force remains in doubt and the Government thought it right and fair to that Service and to the distinguished officers who are at its head, and no less fair to the other two great Services, that they should define their attitude in this matter so that all may know what is expected of them and what system they would have to follow."

That is the Government's opinion, and though it is said that one has to agree with the present Government on anything, one has at any rate the satisfaction of agreeing with a statement by the Leader of the Conservative Party in that Government so that in agreeing one can retain one's self respect.

Major-General Seely, Admiral Sueter and Sir W. Joynson Hicks on one side and Admiral Hall on the other lamented that they and their respective partisans were unable to get in their respective speeches. So far as Admiral Hall is concerned, one thinks that he was fortunate, as undoubtedly the supporters of the Air Force would have annihilated any argument that the Naval side had put up.

Henceforth the R.A.F. is entitled to regard itself as the first line of defence, *vice* the Navy, retired hurt.—C. G. G.

## THE AIR ESTIMATES.

The Air Estimates for the financial year 1922-23 were issued on March 17th. They will be debated in the House of Commons while this issue of *THE AEROPLANE* is being printed. Therefore it is impossible to deal with the debate this week. That being so, one can only deal with the Estimates by stating a few of the figures for purposes of reference.

With the Estimates was issued a memorandum from the Secretary of State for Air which is itself in some respects of more vital importance than the Estimates themselves. In that memorandum appears the following passage: "The net total of the Air Estimates now presented is £6,935,500 for normal services and £950,500 for war liabilities, making £7,886,000 in all. The comparable figures for 1921-22 (original Estimates) were £15,800,000 for normal services and £1,471,000 for war liabilities, making £17,270,000 in all. There is thus a reduction of about £6,400,000, or 37 per cent. A reduction of some 20 per cent. was, in compliance with the directions given by the Government to all departments and effected in the Sketch Estimates prepared in July, 1921, and laid before the Geddes Committee; the remaining savings have been effected subsequently, on lines partly suggested by the Committee and partly arrived at independently."

After it appears the following: "The Estimates provide for an appropriation-in-aid amounting to £3,733,000 in respect of Middle East services. This sum is voted under Class V, 3, of the Civil Service Estimates, and is repaid by the Colonial Office to the Air Ministry."

From the Estimates themselves it becomes evident that including all Appropriations-in-Aid besides those from the Middle East the actual total expenditure on the R.A.F. this year will be £15,666,500 as against £10,783,067 last year. On the net estimates for the Air Force itself the decrease this year is £7,516,477, but after allowing for Appropriations-in-Aid the actual decrease in expenditure on the R.A.F. is only £4,116,467, so that really the Air Force is not being robbed as badly as it might have been, even admitting that something over 20 per cent. is a serious reduction, the more so when one considers that the total net estimates for the R.A.F. proper amount to rather less than the cost of two capital ships for the Navy.

### THE ECONOMIES.

How the economies have been effected is shown in the following statement:—"The active strength of the Air Force will be reduced by the equivalent of two Squadrons. The Geddes Committee contemplated that (failing some equal or greater reduction in the Navy or Army) a reduction of eight and a half Squadrons could be made. The Government have fallen in with the views of the Committee to the extent of directing that, over and above the actual reduction of two Squadrons, the equivalent of three more Squadrons should be withdrawn from Navy and Army co-operation and allocated primarily to Home Defence. The Squadrons will still be available for co-operation work on special occasions when required. They will also be used for training purposes, thus enabling economies to be made in the training establishments."

### FALSE ECONOMY.

The following paragraph is also of considerable importance: "A considerable portion of this difference is attributable to the fact that, as explained above, in order not to demote the Navy and Army of Air co-operation, and in order to enable the nucleus of a force for Home Defence to be set up, all but two Squadrons are to be retained. The remaining recommendations of the Committee have

received the most careful consideration, and effect is being given to them to a very large extent. To take the most important items of reducible expenditure, works services have been cut to a bare minimum, and stocks of machines, engines and spares will be drawn on without replacement wherever possible. Here, however, a word of caution is necessary.

"The 'reconditioning' of machines (see page 92 of the Geddes Report, Part I) is not a process of improvement and embellishment, but one of making machines safe to fly. Economics in this direction must be governed by a sense of the most serious responsibility. Apart from this it should be realised that the patching up of temporary buildings and living on stocks is essentially a process of deferment of expenditure which must tend to force Air Votes up again in future years, and is justified only by extreme financial pressure."

Here at any rate is a distinctly hopeful statement. What it really means is that in order to defend the vested interest of the Navy the pilots and observers of the R.A.F. are to be compelled for a year or so to fly on obsolete war machines built almost entirely of war emergency material which to-day would not be passed by the Aeronautical Inspection Department as fit to use in a modern aeroplane. Nevertheless the Government having recognised the fact that the R.A.F. is now the first line of defence the Air Force Votes in future will grow larger, and about a year hence we may expect to see the R.A.F. equipped with modern aeroplanes such as those which are at present merely being produced experimentally. And the cost of re-equipping the R.A.F. will have to come out of the Navy Vote in future.

The memorandum also states that power has again been taken to organise an Auxiliary Air Force on a territorial basis as last year, when the Air Council were compelled to defer expenditure on this branch for another twelve months. Personally one hardly expects anything to be done about it this year.

Expenditure on the staff of the Air Ministry has been reduced by £235,000.

### DETAILS.

In the Abstract Estimates themselves one finds that £411,000 has been allocated to Civil Aviation and a footnote referring to this figure states that it "Includes certain non-effective charges in respect of these Services." Personally one would be inclined to class the whole expenditure on Civil Aviation as in respect of non-effective services.

Under Vote 1 there appears a charge for the salary of two Air Marshals. This is distinctly of interest as at present we have only one. It is to be assumed therefore that it foretells the promotion of Air Vice-Marshal Sir John Salmond to the rank of Air Marshal, thus giving him rank corresponding to Lieutenant-General, which would seem to be necessary in view of the fact that the Army Commander in Iraq could not well be of a lower rank. The natural corollary to such a promotion would be the conferring of the rank of Air Chief Marshal (which is equivalent to a full General) on Sir Hugh Trenchard, but one notes that no provision is made in the Estimates this year for the pay of an Officer of such rank.

Provision is also made for four Air Vice-M Marshals, eleven Air Commodores, and thirty Group Captains.

Vote 2, which deals with Quarters and Supplies, calls for no comment.

Vote 3, Technical and Warlike Stores, contains the great disappointment of the Estimates. The total vote for aeroplanes, seaplanes, engines and spares is £786,000. This is obviously barely enough to cover spares and to allow enough

over to pay for the equivalent of a single squadron with really new machines.

The actual vote is £380,500 for complete machines and only £86,500 for engines. How on earth the Air Ministry expects the aeroplane and engine manufacturers to carry on and produce improved machines with such votes is incomprehensible.

Airships and balloons have £100 each allocated to them, so presumably it is intended that kite balloons shall cease to exist.

The sole and only increase in this most important branch is in wireless equipment, on which £53,000 is to be spent as against £50,500 last year.

Vote 4, for the Works and Buildings Department, which is about the least efficient of all departments under the Air Ministry, has £1,826,000 allocated to it. It would be useless to criticise this department which only has one saving grace as compared with the Department of Civil Aviation, which is that it is necessary to have bricks and mortar to house the R.A.F., whereas the Civil Aviation Department really is not a necessity at all. Most of the sums voted to the Works and Buildings Department are unduly generous, with the exception of the most necessary item of all, Married Quarters for all ranks, on which it seems some saving has been attempted.

Vote 5, for the Air Ministry itself, is £68,000, a saving of over £235,000. Unfortunately it is not shown exactly how these savings have been effected. On the whole, the savings seem to have been made without the probability of sacrificing efficiency and where some slight increases appear they are distinctly in the right departments, namely the Directorate of Training and the Directorate of Personnel.

Vote 6, Miscellaneous Effective Services and Vote 7, Non-Effective Services, such as half pay, pensions, etc., call for no comment.

#### WHY CIVIL AVIATION IS A FAILURE.

Vote 8, Civil Aviation, is a truly lamentable affair. Apparently the total is only £364,000, but one finds that there is a further £86,512 to be added onto that for the Department of the Controller-General of Civil Aviation at the Air Ministry. Even allowing that more than half of the latter sum belongs to the Meteorological Office at the Air Ministry the balance of something over £235,000 for the Air Ministry section of the Department of Civil Aviation seems enormous. Civil Aviation subsidies account for £207,000, Works and Buildings for £61,000 and Civil Aerodromes for £38,000, whereas Aerial Routes, Surveys, etc., have only £15,000 allocated to them. Now one begins to understand why Civil Aviation is a failure under the present Controller-General of Civil Aviation.

Further light is thrown on this subject when one turns to the Works and Buildings item and finds that for the two financial years, 1921-22 and 1922-23, the amount already voted, including re-votes, for Works, Buildings and Lands, runs up to over £417,000. There are £6,200 for lights at Croydon which have not saved as many pennyworths of crashes. £21,000 is at Lympne for altering the power house, re-constructing the water main, providing pumps and reservoirs and fitting landing lights. Such a sum should come very near covering the total value of all the buildings that are ever likely to be wanted at Lympne, for as time goes on Lympne is likely to become less and less important and to become merely an emergency landing ground and wireless telephone station. Then we have £8,000 for a wireless station at Kidbrooke, or the existence of which one personally hears now for the first time. Apparently all the wireless telephoning of Civil Aviation is done from Croydon and Lympne.

Then we come to the real crimes of General Sykes' Department, £13,000 at Malta for levelling an aerodrome which nobody is ever likely to use and which in any case ought to

be laid out by the R.A.F.; £7,000 for a wireless station at Malta when there must inevitably be an R.A.F. aerodrome there in any case; £40,000 for Lighting on Routes—Heaven knows who has ever been benefited by such lighting or who is likely to be benefited; and last and most criminal of all, £15,000 for Air Lights in Egypt.

Of course, all this utter waste of public money is really evidence of General Sykes' immense foresight. Such expenditure in such places may be justified five or ten years hence when air lines have been developed and trade is good and money is available. At present they are merely proof that General Sykes is thoroughly unfitted for his position. Excess of foresight may easily be as fatal as blindness, in that money which is badly needed for the first steps of a new development may be squandered, as this money has been squandered, in developments at a distance which can never be attained unless the first steps are taken under proper control. In fact, what General Sykes has done is to buy a Rolls-Royce for the Civil Aviation Baby when he ought to have bought it a Perambulator.

Many a competent officer in the Navy and the Army has been "broke" for mistakes less serious than those which General Sykes has made, and if General Sykes is allowed to remain in his post it may surely be taken as an indication that his political influence is greater than the Government's belief in Civil Aviation.

#### RESEARCH.

Vote 9, Experiment and Research, amounts to £1,177,000. From this one gathers that experiment and research at Martlesham Heath is to continue, as is the Experimental Station at Isle of Grain.

It strikes one that the total of £424,000 to be expended on the Royal Aircraft Establishment at Farnborough is high considering the comparatively small amount of progress directly due to Farnborough. One says this while fully recognising the fact that the Superintendent and his senior assistants are extremely good men whose services the Government has acquired for very low salaries as shown in the Estimates. The trouble at Farnborough seems to be that there are too many junior people whose money is so low that they cannot possibly be efficient.

As against this it is at any rate encouraging to find that £536,000 is allocated for the purchase of experimental aircraft, and £105,000 for experimental engines. If this is skillfully distributed among the trade firms it will make it just possible for the leading firms in the trade at any rate to pull through until a more generous vote for the R.A.F. is obtained next year.

#### GOOD WORK.

On the whole, the Air Council is to be congratulated on having produced an extremely lucid expenses account and on having allocated the available money very wisely. Naturally the Economy-at-any-price Press cries out against the total expenditure on the grounds that the cut is not as great as was recommended by the Geddes Committee. These papers obviously have not the intelligence to understand that an increase of another ten or twenty millions on the Air Force Vote would make it possible to economise twice as much on the Navy and Army Votes.

This lack of intelligence is demonstrated by the remark in a leader in the *Daily Mail* to the effect that the Estimates are presented in a tangled form. Seeing that anything more than three figures in a row are usually more than one can personally understand, the fact that one has been able easily to understand all the Air Ministry figures is the best possible proof of their lucidity. One can only hope that a year hence we may see the increased Estimates at which Captain Guest hints in his memorandum.—C. G. G.

#### A ROYAL VISIT.

Their Majesties the King and Queen paid a private visit to the R.A.F. Club on March 14th. They were received by the Viscount and Viscountess Cowdray, Brig.-Gen. R. H. More and Maj. R. D. Anderson, Secretary of the Club.

#### ANOTHER INTERNATIONAL CONFERENCE

It appears from the daily Press that there has just been held in London a conference between representatives of the Air Authorities of Britain, France, and Belgium relative to the operation of the International Air Convention.

It is stated that complete agreement was reached on the numerous questions of detail which had arisen, and that complete harmony prevails between the said representatives. Sir Frederick Sykes acted as chairman; France was represented by M. Laurent Eynac (French Under Secretary of State for Air), and Col. Sacconey, and Belgium by Col. Van Crombrugge and other members of the Civil Aviation Staff.

Sir Frederick Sykes is apparently becoming a close second to the Prime Minister in his capacity for conducting cordial conferences which lead only to comforting reassurances, and further conferences. The official policy of "darkness and

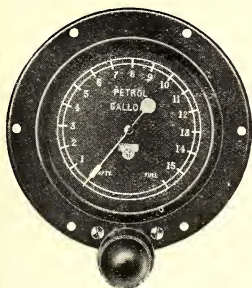
composure" which did not altogether satisfy the general public in its original application to the uncivil operations of German aircraft during the War appears to meet with less disfavour in its modern application to peaceful air navigation policy.

#### A FARMAN-BREGUET AIR LINE FUSION

It has been reported that the Compagnie des Messageries Aeriennes (Breguet) and the Société Generale de Transport Aérien (Farman) have amalgamated under the title of Cie des Messageries Aeriennes. This line will operate in conjunction with the S.N.E.T.A., an Amsterdam-Brussels-Paris-Marseilles service, which will eventually be extended to Algiers. The Messageries Aeriennes will also exploit a London-Marseilles service.

M. Pierrot, of the Syndicat Nationale Aérien has been appointed Technical Director of the company, and orders have been placed for 11 Farman "Goliaths" to be fitted with 300 h.p. Renault engines. In these machines a large luggage compartment is being installed, the remaining space being fitted for the transport of 5 passengers.





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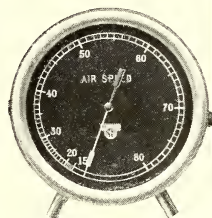
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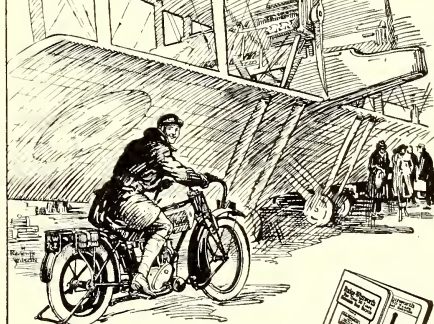
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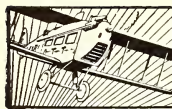
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# COMMERCIAL AERONAUTICS

## AND CIVIL AERIAL TRANSPORT.



### THE UNITED KINGDOM OF GREAT BRITAIN AND IRELAND.

#### CONTINENTAL ARRIVALS AND DEPARTURES.

[The following table of arrivals at and departures from the British Air Ports is compiled on the following system:—First comes the initials of the Air Line; next the type of machine; next the international number of the machine; next the ports of departure and destination; next the times of departure and arrival; next the cargo, whether goods (G) and/or mails (M); next the number of passengers; and finally the name of the pilot and number of mechanics, if any.]

The London Terminal Aerodrome, Croydon. (Telephone: Croydon 2720.)

#### MARCH 13th:

K.L., Fokker, H-NABC, London-Adana, 10-16-17, G.M.T., Nil, 1, Duke  
I.L., DH4, G-EAMU, London-Paris, 12-35-15, G.M., Nil, Robins.  
H.P., DH4, G-EAWW, London-Paris, 12-32-16-20, G., 1, Rogers.  
I.L., DH18, G-EAWW, Paris-London, 12-00-14-23, G., Nil, Shaw & 1.  
H.P., HP, G-EATH, Paris-London, 12-02-14-43, G., 1, McIntosh & 1.  
G.E., Goliath, F-GEAC, Paris-London, 12-12-14-41, G., 3, Favreau & 1.

#### MARCH 14th:

G.E., Goliath, F-ADDT, London-Paris, 11-47-17-20, G., 1, Favreau & 1.  
M.A., Spad, F-ADJ, London-Paris, 12-20-15-20, G., Nil, Paille.  
H.P., Bristol, G-EAWY, London-Paris, 12-15-15-35, G.M., Nil, Wilcockson  
I.L., DH18, G-EAWW, London-Paris, 13-00-15-20, G.M., 1, Holmes & 1.  
M.A., Goliath, F-ADCA, Paris-Ldn, 14-07-13-18-23, G.M., 5, Challouix & 1.  
G.E., Goliath, F-GEAC, Paris-London, 12-35-15-35, G.M., 3, Labouchere & 1.  
H.P., DH4, G-EAWW, Paris-London, 12-00-14-00, G., 2, Rogers.  
I.L., DH4, G-EAMU, Paris-London, 12-02-14-02, G., Nil, Robins.  
M.A., Breguet, F-ADBO, Paris-London, 13-10-15-45, G.M., 2, Charpentier.

#### MARCH 15th:

H.P., HP, G-EATH, London-Paris, 12-32-15-47, G.M., 5, McIntosh & 1.  
G.E., Goliath, F-GEAC, Ldn-Paris, 12-20-16-00, G., 1, Labouchere & 1.  
M.A., Spad, F-ADAJ, Paris-Ldn, 12-35-15-35, G., Nil, Robins.  
I.L., DH4, G-EAMU, London-Paris, 12-35-15-20, G.M., Nil, Robins.  
G.E., Goliath, F-GEAD, Paris-London, 11-55-15-17, G., 4, Gastoux & 1.  
M.A., Goliath, F-EARI, Paris-London, 13-05-16-16, G.M., 4, Dorr.  
I.L., DH18, G-EAWW, Paris-London, 12-35-15-34, G., 3, Holmes & 1.  
H.P., Bristol, G-EAWY, Paris-London, 13-15-15-55, G., 3, Wilcockson & 1.

#### MARCH 16th:

G.E., Goliath, F-GEAC, London-Paris, 11-25-14-40, G., 1, Gastoux & 1.  
M.A., Goliath, F-ADCA, London-Paris, 12-17-15-22, G., Nil, Challoux & 1.  
H.P., Bristol, G-EAWY, London-Paris, 12-30-14-50, G.M., 4, Rogers & 1.  
I.L., DH18, G-EAWW, London-Paris, 13-00-15-00, G.M., 3, Holmes & 1.  
H.P., HP, G-EATH, London-Paris, 12-30-15-00, G.M., 3, Holmes & 1.  
G.E., Goliath, F-ADDT, Paris-London, 11-35-14-24, G., Nil, Mire & 1.  
H.P., HP, G-EATH, Paris-London, 12-00-15-35, G., 1, McIntosh & 1.  
I.L., DH18, G-EAWW, Paris-London, 12-15-15-35, G., 3, Holmes & 1.  
M.A., Spad, F-ACME, Paris-London, 13-05-16-21, G.M., 2, Donlin.

#### MARCH 17th:

I.L., DH18, G-EAWW, London-Paris, 12-20-15-35, G.M., 5, Robins & 1.  
H.P., HP, G-EATH, London-Paris, 13-35-16-18, G.M., 5, McIntosh & 1.  
M.A., Breguet, F-ADBO, Ldn-Paris, 14-22-15-05, G.M., 4, Rogers & 1.  
M.A., Spad, F-ACME, Paris-Ldn, 13-13-15-00, G.M., 1, Briere.  
I.L., DH18, G-EAWW, Paris-London, 13-15-15-35, G., 3, Holmes & 1.  
H.P., Bristol, G-EAWY, Paris-London, 13-17-16-05, G., 7, Rogers & 1.

### The London Terminal Aerodrome.

#### THE AIRCRAFT DISPOSAL CO.

On Tuesday Mr. Stocken put four Martinsydes and one Avro through their acceptance tests for a foreign Government and the following day he completed the tests of a fifth "Tinsyde." On Thursday he was up testing a Bristol "Fighter."

Major Grant has evolved a very simple but nevertheless a very effective form of silencer. It consists of a long exhaust pipe with an expansion chamber at the end. It cuts out the noise of the engine more satisfactorily than any other silencer that one has yet heard of and at the same time involves the loss of less than 25 revs. (For the benefit of *Bullseye* Basil one would explain that means 25 revolutions per minute.) The silencer is cheap to produce as it can be sold at a profit for £20.

Major Grant has fitted the first silencer to a D.H.9 and Mr. Larry Carter took oneself up in the machine on its first test. We found that we could talk quite easily in the air and on shouting to people on the ground we could easily be heard.

The silencer can be made for any type of engine and Mr. Levertan has his eye on it already for fitting to Fokker machines.

On Friday Mr. Stocken tested two more "Tinsydes" and an Avro. He had a little trouble with the Avro at first, having to make a hurried landing just after taking-off.

A D.H.9 with an unorthodox type of engine will shortly make its appearance and should be an exceedingly interesting job.

By way of ensuring perfection on all their machines, the

ABBREVIATIONS:—A.D.—Aircraft Disposal Co. B.A.—Berkshire Aviation Co. B.C.—Bristol Aeroplane Co. B.M.—Brompton Motor Co. C.A.—Department of Civil Aviation. D.H.—De Havilland Aircraft Co. G.E.—Compagnie des Grands Express Aeriens. H.P.—Handley Page Transport Ltd. I.L.—Instone Air Line K.L.—Koninklijke Luchtvaart Maatschappij. L.A.—Leatherhead Aviation Services. M.A.—Messageries Aeriennes. M.W.—Marconi Wireless Telegraph Co. Ltd. P.O.—Privately owned. P.L.—Peters Ltd. S.F.—Surrey Flying Services. S.N.—Syndicat National pour l'Etude des Transports Aeriens (S.N.E.T.A.).

M.A., Breguet, F-CAAK, Paris-London, 14-22-17-05, Nil, 2, Delage.  
I.L., DH4, G-EAMU, Paris-London, 15-05-17-30, Nil, Nil, Brady.

#### MARCH 18th:

H.P., Bristol, G-EAWY, London-Paris, 12-40-15-22, M., 7, Rogers & 1.  
M.A., Goliath, F-EARI, Paris-London, 13-32-16-37, Nil, 3, Dorr & 1.  
M.A., Spad, F-ACME, London-Paris, 13-35-16-35, G., Nil, Douchin  
G.E., Goliath, F-GEAD, London-Paris, 13-35-16-20, G., Nil, Gastoux & 1.  
I.L., DH18, G-EAWW, London-Paris, 15-30-18-17, G.M., Nil, Holmes.  
G.E., Goliath, F-GEAO, Paris-London, 12-03-14-28, G., 1, Favreau & 1.  
I.L., DH18, F-EAWO, Paris-London, 12-10-14-34, G., 2, Robins & 1.  
H.P., HP, G-EATH, Paris-London, 12-12-14-55, G., 7, McIntosh & 1.  
M.A., Spad, F-ADJ, Paris-London, 13-00-15-30, G.M., 2, Le Sec.

#### MARCH 19th:

H.P., DH4, G-EAWW, London-Paris, 12-00-14-05, Nil, 2, Shaw.  
I.L., DH18, G-EAWW, London-Paris, 12-30-15-30, Nil, 1, Courtney.  
I.L., DH18, G-EAWW, Paris-London, 12-00-14-35, G., 3, Holmes & 1.  
H.P., DH4, G-EAWW, Paris-London, 15-10-17-20, Nil, Nil, Shaw.

### Inland Flying at Croydon.

March 13th.—I.L., Vimy (tests (Barnard and Brady); H.P., H.P. test (Olley).

March 14th and 15th.—Nil.

March 16th.—S.F., Avro, joy-rides (Muir).

March 17th.—H.P., H.P. test (McIntosh).

March 18th.—R.A.C., Avro joy-rides (Walter); S.F., Avro joy-rides (Muir).

March 19th.—I.L., D.H.18 tests (Brady); S.F., Avro joy-rides (Muir).

### Flying by the Aircraft Disposal Co.

March 13th.—Nil.

March 14th.—Four Martinsydes, (tests (Stocken); Avro, test (Stocken).

March 15th.—Martinsyde, test (Stocken).

March 16th.—Bristol Fighter, test (Stocken); D.H.9, G-EABD, test (Carter).

March 17th.—Two Martinsydes (Stocken); Avro (Stocken).

March 18th.—Nil.

### Cross-Channel Statistics.

Week ending March 19th:—

Machines, 53; Passengers, 113; Crews, 88, Total Personnel, 201

Corresponding week last year:—

Machines, 35; Passengers, 92; Crews, 43; Total Personnel 135

A.D.C. have decided to remagnetise all the magnetos on their hands in case any of them have suffered from *anno domini*.

#### GENERAL FLYING.

Mr. Olley was flying the "Jupiter"-engined O/400 on Wednesday and on Thursday he took it to Paris to demonstrate the engine to the French authorities.

The previous week when the Bristol returned from Paris it was seen to have several curious excrescences on its undercarriage which fell off on landing. On examination, these were found to be large pieces of plank about 7 ft. by 2 in. by 9 in., which must have been picked up at Le Bourget as the machine took off, though the pilot did not notice running into anything. One can imagine the howl there would be if the C.A.T.O. at Croydon allowed his men to leave planks lying around "permisks like."

By the way it was recorded last week how a certain air line had styled itself "Britain's Premier Air-Line" and how it was stated that Handley Page Transport were well established as an air line before the other line were even heard of.

The sequel is too good to go unrecorded. A day or so afterwards, on the H.P. offices next to the "Premier Air Line" sign there appeared the following: "Handley Page Transport Ltd. Also Flew!"

One believes that the author of this was Mr. Cogni, and if this is correct, he is certainly to be congratulated on having a truly subtle sense of humour. Anyway it is very distinctly a score to Handley Page Transport.

Early in the week Mr. Shaw flew a D.H.18 to Paris and was

surprised to encounter good weather on the outward journey. However the meteorological people woke up to the fact that Mr. Shaw was on the route before he came back and arranged the usual high wind, rain and low clouds which they always keep in store for him.

Mr. Bradley flew as passenger to Paris on Thursday in a D.H.18 piloted by Mr. Holmes, in order to fetch the D.H.4a back from Paris. It was a most touching sight to see him, as the machine was taking off, nonchalantly selecting a newspaper from the rack and there setting an example to other passengers.

He started back on the "4a" on Friday but had to put back to Paris again. He restarted later and made Croydon.

The "Daimler Airway" begin their service on Monday week. It is hoped to have at least two and probably three D.H.34s by then. The service advertises the fact that its time between London and Paris will be 125 minutes. The Paris manager and chief pilot will be Mr. Hinchliffe and the other pilots are said to be Messrs. Duke, Herne and Robertson. The latter has been doing much civil flying in India. Mr. Herne is at present in Morocco but is expected home shortly.

On Thursday, the French Air Minister, M. Laurent Eynac, arrived from Paris in a Goliath belonging to the Cie Messageries Aeriennes. As the machine came into sight from the direction of Eastbourne, the more demonstrative of the French officials present reverently raised their hats though the machine was a mile or so distant. M. Eynac was received by Sir F. H. Sykes.

Sir Ross Smith was present on that day also, attended by a representative of D. Napier and Son Ltd. Mr. Bennett, who will accompany Sir Ross, is staying at Croydon for a few days seeing the Napier "Lion" under service conditions and imbibing words of wisdom from Mr. Hall.

Mr. Muir has again been carrying joy-riders in his Avro and on Thursday he took up the irresponsible "Wilfred" and a friend who was trying her wings.

The K.L.M. start up their service again on April 18th, once again using the Fokker type F.III. The service will leave Croydon at 10.00 hours, arriving at Rotterdam at 13.30 hours, where there will be a wait of 15 mins. and they will arrive at Amsterdam at 14.15 hours. The incoming machine leaves Amsterdam at 10.30 hours and lands at Rotterdam at 11.00 hours. Leaving again at 11.15 it should make Croydon at 14.15 hours.

On Sunday Mr. Shaw "also flew" to Paris and back on the D.H.4a, G-BAWH, belonging to the premier established British Air Line, Handley Page Transport.

The same day Mr. Courtney flew a D.H.18 to Paris and Mr. Holmes returned on another one. On Saturday Mr. Bradley did his first flight on a D.H.18 and found all quite satisfactory.—G. D.

### Brooklands.

As is the case on or near other aerodromes and "places where (and over which) they fly" the word "Weybridge" is now set out in a field on the opposite side of the railway to Brooklands aerodrome. The whitish-khaki-colored letters can be read by pilots approaching from northern directions. However, one imagines that a pilot would scarcely fail to discover his whereabouts when within twelve miles of Brooklands, as the motor track is a clearly defined landmark.—J. F. S.

### Stag Lane.

It seems that the Instone Bros. do not intend to take the competition of the Daimler Airway lying down, for there is a D.H.34, the standard machine of the Daimler Airway, almost completed at the works of the De Havilland Co. at Stag Lane painted the familiar Reckitts blue.

There are three D.H.34s almost ready for the Daimler Airway, one has already been painted bright red and the registration is G-BBBO and two others are about to be painted red. Two further machines have their fuselages being completed.

### THE ROSS SMITH FLIGHT.

It has now been decided that Sir Ross Smith will begin his flight round the world early in May and not in April as previously announced.

The machine, a Vickers "Viking IV" with a 450-h.p. Napier "Lion" engine, will be tested at Brooklands probably this week. It will have a maximum range of 2,200 miles but the flight will be attempted in stages averaging about 500 miles.

The start will be made from Croydon and it is hoped that the finish will be there also. The first stage will be as far as Lyon and thence Sir Ross will follow as far as Rangoon the same route as he followed on the flight to Australia. He will then make for Tokio, where he will find a spare engine waiting to be fitted if necessary.

Thence he will fly on up to the Northern extremities of the Japanese Empire and will cross the Pacific to Alaska via the Aleutian chain of islands.

He will cross Canada to Toronto and here he will find a second spare engine. At Toronto the machine will be thoroughly overhauled in preparation for the Atlantic flight. The machine will fly from Toronto to St. John's, Newfoundland, which should give the new engine ample time to "find itself."

Whether Sir Ross Smith will make a direct flight across the Atlantic or whether he will go via the Azores will depend on circumstances at the time.

He will be accompanied by his brother, Sir Keith Smith, and Mr. Bennett both of whom were with him on the Australian flight. It is hoped that they will return to Croydon some time in July.

### MIXED BATHING OFF HASTINGS.

The second Vickers "Valentia" flying-boat fitted with two Rolls-Royce "Condor" engines came to grief off Hastings on Wednesday, the Ides of March.

The machine was launched at the Saunders yard at Cowes the previous week and was successfully towed up the River Medina to her moorings. Whether or not there were any trial flights one does not know, but on Wednesday Messrs. Cockerell and Broome with Mr. James Wyatt, late sergeant-major, R.A.F., started off from Cowes to deliver the machine to the R.A.F. station at Isle of Grain.

Owing to some cause not yet known, the machine came down in the sea off Hastings and the impact with the water apparently rendered the hull unseaworthy as the machine was submerged and the occupants took to the tail, whence they were rescued after some forty minutes.

Whatever was the cause of the mishap it was not due to engine trouble and Rolls-Royce Ltd. have received an official notification of this fact from Vickers Ltd.

It will be recollected that the first "Valentia" met with a somewhat similar mishap some months ago at Grain.

### H. G. HAWKER ENGINEERING CO. LTD.

It is most gratifying to note that the firm founded by the late Mr. Harry Hawker, which has hitherto been known for its excellent motor cycles, is turning its attention to aircraft.

The firm have rented a portion of the old Sopwith works, and here they are busy re-conditioning some "Snipes" and converting them into two-seaters.

The firm also are busy on a new two-seater machine to the order of the Air Ministry. It is intended for reconnaissance work, and some models will be fitted with the 300-h.p. Siddeley "Jaguar" engine and others with the 400-h.p. Bristol "Jupiter." The machine will not be out until late in the year, but its appearance will be awaited with interest. It will be known as the "Sopwith-Hawker."

Mr. Sigrist, late works director of the now-in-liquidation Sopwith firm, is chairman of the new company, and Mr. T. O. M. Sopwith is a director.

### PERSONAL NOTICES.

#### ENGAGEMENT.

HARRISON-NEVE.—The engagement is announced between Mr. Philip E. Harrison, late the Bufile and R.A.F., eldest son of Maj. A. H. P. Harrison and Mrs. Harrison, of Greenhill Farm, Farnham, Surrey, and Neve, only daughter of Mr. and Mrs. F. F. Neve, of Johannesburg, South Africa.

#### MARRIAGE.

LAVERS-SMITH.—On March 15th, at The Abbey, St. Albans, Capt. Charles Stewart Touzeau Lavers, D.F.C., elder son of Mr. and Mrs. C. H. Lavers, Clarence Road, St. Albans, to Elsie, youngest daughter of Mr. and Mrs. A. H. Smith, "Norland," Woodcock Road, St. Albans.

#### BIRTHS.

ARCHER.—On March 15th, at Burntwood Cottage, Caterham, the wife of S/Ldr. J. B. Archer, C.B.E., R.A.F.—a daughter.

BAYLY.—On March 15th, at Graysville Cottage, St. Leonards, Tring, to the wife of F/Lt. L. J. St. G. Bayly, M.C.—a daughter.

BROCK.—On March 6th, at 10, Blenheim Crescent, South Croydon, the wife of Wing-Comdr. H. M. Brock, R.A.F., of a son.

HOWARD-WILLIAMS.—On March 13th, at Staffa, Cowes, the wife of F/Lt. E. L. Howard-Williams, M.C., of a son.

LUCAS.—On March 5th, at "Elancourt," Watlington, Kent, to Ethel Florence, the wife of F/O. L. G. Lucas, R.A.F., a son.

POWER.—On Feb. 22nd, at Alexandria, the wife of S/Ldr. D. Arcy Power, M.C., R.A.F., Mcd. Serv., of a son (stillborn).

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Oldbury, Birmingham.

Makers and manipulators of weldless steel tubing.



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	See Advertiser Page
Bristol Aeroplane Co., Ltd., The, Filton House, Bristol "Aviation," Filton. Bristol 3906 .....	Back Cover
De Havilland Aircraft Co., Ltd., The, Stag Lane Aerodrome, Edgware. "Havilland," Edgware. Kingsbury 160-1, (2 lines) 213	
Fairley Aviation Co., Ltd., The, Hayes, Middlesex "Airly," Hayes, Middlesex. Hayes, Middlesex 19 .....	203
N. V. Nederlandsche Vliegtuigenfabriek, Amsterdam "Fokkplanes," Amsterdam. Fabrick C 3617-647 .....	211
Parnall, George, & Co., Coliseum Works, Park Row, Bristol "Warplanes," Bristol. Bristol 4773 (2 lines) .....	214
Roe, A. V. & Co., Ltd., Newton Heath, Manchester "Triplane," Manchester. City 8330-1, Manchester .....	Inside Front Cover
Short Brothers (Rochester & Bedford), Ltd., Seaplane Works, Rochester, Kent. "Scarlanes," Rochester. Chatham 62 .....	Inside Back Cover
Supermarine Aviation Works, Ltd., The, Southampton "Supermarine," Southampton. Woolston 37 (2 lines) Inside Back Cover	
Vickers, Ltd., Vickers House, Broadway, London, S.W.1. "Vickers," Vic, London. Victoria 6600 .....	206
Westland Aircraft Works, Yeovil. "Aircraft," 147 Yeovil. Yeovil 147 .....	209

## ALUMINIUM PISTONS.

London Die Casting Foundry, Ltd., The, Tremlett Grove, Junction Road, Holloway, N.19.  
"Charcoal," Tipton, London. Hornsey 1580 (2 lines) .....

## BUILDING MATERIALS.

Sankey, J. H., & Son, Ltd., Essex Wharf, Canning Town, London, E.16 "Sankey," Canning Town. City 5077 (2 lines) ... 217

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MacLennan, John, & Co., 115, Newgate Street, London, E.C.1. "Vandura," Cent. London. City 3515 .....

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Titanine, Ltd., Empire House, 175, Piccadilly, London, W.1. "Tetrafree," Piccadilly, London. Gerrard 2315, Regent 4728 .....

"Tetrafree," Piccadilly, London. Gerrard 2315, Regent 4728 .....

Front Cover & 214

## ENGINES.

Armstrong Siddeley Motors, Ltd., Coventry. "Sidarm," Coventry. Coventry 451 .....

Bristol Aeroplane Co., Ltd., The, Filton House, Bristol. "Aviation," Filton. Bristol 3906 .....

Napier, D. & Son, Ltd., 14, New Burlington Street, London, W.1. "Strutifer," London. Gerrard 8926 (4 lines) .....

205

## FLotation AIR BAGS.

R.F.D. Company, 21, Queen's Road, Hershham, Surrey. Esher 365 .....

220

## INSTRUMENTS (Speed Indicators, etc.).

Smith, S., & Sons, Ltd., 179-185, Great Portland Street, London, W.1. Mayfair 6350 (6 lines) .....

217

## MOTOR BICYCLES.

Rudge-Worth, Ltd., Coventry. "Rudge," Coventry. Coventry 1104 .....

217

## STEEL TUBING.

Accles & Pollock, Ltd., Oldbury, Birmingham. "Accles," Oldbury. Oldbury 111 .....

219

## TEST PILOTS.

Tait-Cox & James, c/o S. Heckstall Smith, F.R.Ae.S., 4, Golden Square, London, W.1. Gerrard 3489 .....

220

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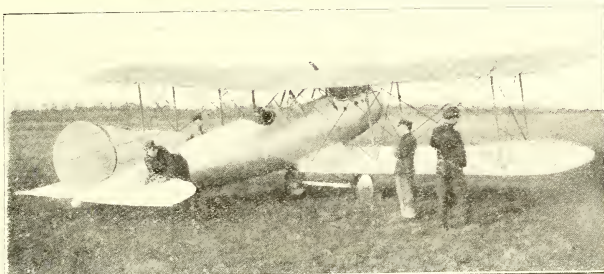
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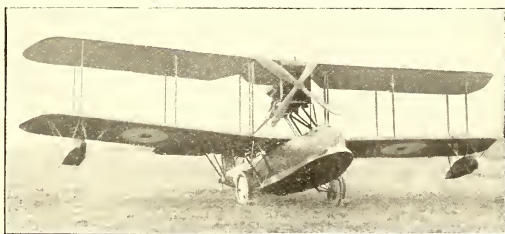
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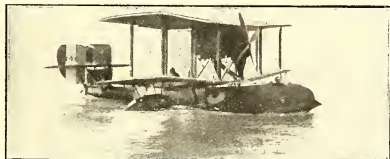
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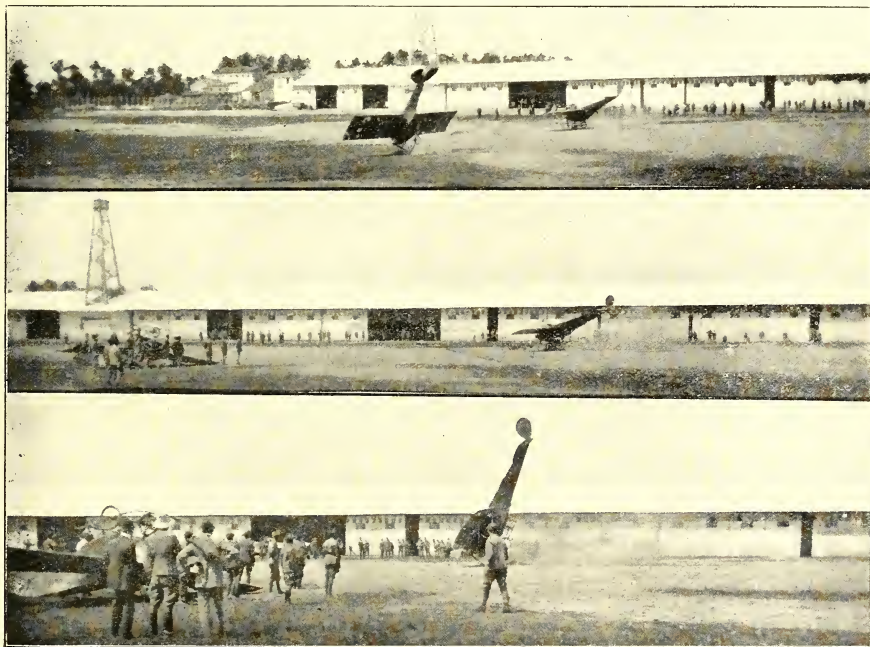
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## ON A GREAT PIONEER.

Urgency of our own political affairs together with scarcity of space in this paper has prevented one hitherto from paying tribute to the memory of one of the greatest of the pioneers of aviation whose recent death is none the less to be lamented because he has been little concerned with aircraft of late years.

Levasseur, the famous designer of the Antoinette engine and monoplane, died in France on or about Feb. 25th at the age of 58. In him France, the true cradle of aviation, has lost one of the most brilliant of that galaxy of aeronautical engineers who until the outbreak of war maintained French aircraft designs far in front of the rest of the world.

The present generation of aviators and aircraft designers have hardly heard of the name of Levasseur, and probably the majority of those who have done so confuse the name in their own minds with that of M. Pierre Levasseur, famous during the war for his aircrews and more recently for his wonderful biplane, the only truly original aeroplane at the recent Paris Aero Show. But in the infancy of aviation Levasseur was a name associated with all that was best and most advanced in the design of aeroplanes and engines.

### The Antoinette Engine.

Levasseur first became famous in the then limited field of motoring and aviation when in 1906 or thereabouts he produced the famous "Antoinette" engine. Of his career before that date one must plead ignorance, but that engine alone was sufficient evidence that he was an engineer of remarkable ability.

With one of the earliest of these engines, an eight-cylinder V-type of 50 h.p., M. Santos-Dumont made the first authenticated flight in Europe in the Autumn of 1906. Thereafter Blériot, Delagrèze, Voisin, Farman, Ferber, and Latham, the first European aviators, all used the Antoinette engine, at first experimentally and afterwards in successful flights of considerable duration.

### Direct Fuel-Injection.

A remarkable feature of the engine was that instead of a carburettor Levasseur had fitted it with direct injection of fuel, by means of a minute petrol pump to each cylinder, the speed of the engine being governed by varying the throw of the pumps instead of by opening and closing a throttle. This is all the more noteworthy because to-day, sixteen years later, we are still experimenting to find a satisfactory method of injecting fuel direct.

It is true that the Antoinette system was not ideal and that it took a deal of manipulating to induce it to perform its intended functions. But the idea was there many years in front of its time. And its ability to do its work was proved by Latham's record-breaking non-stop flight of 96 miles at the first great Reims Meeting in August, 1909, and various other fine flights by the same and other pilots. Also it must be remembered that for several years the Antoinette engine distinguished itself highly in motor-boat racing, which is recognised as being the most severe test to which an engine can be put.

### Engine Temperature.

Yet another point about the engine which deserves special attention is the fact that Levasseur intended it to be run at a high temperature, above the boiling point of water. It was not fitted with radiators as we understand (or misunderstand) them but with condensers. The water in the cylinder-jackets boiled out, was condensed in long aluminium tubes, and pumped back into the jackets again, there being hardly any water carried in excess of that in the cylinder-jackets. And to-day we are beginning, just beginning, to discover how to get more power and more mileage out of our petrol by running our engines hot.

Naturally the Antoinette suffered continually from trouble with ignition-plugs, for the refined plugs of to-day did not exist. But here is another instance of how far Levasseur was ahead of his time, and even ahead of our time, judging by the fact that our inept Radiator Section at the Air Ministry is still wasting its time endeavouring, apparently, to

discover how to add the most possible weight with the least possible temperature regulation to our unfortunate modern engines.

### The Possibilities of the Antoinette.

It is probable that even greater things might have been done with the Antoinette engine if its little ways had been better understood, for not even its designer or its manufacturers ever got so much power or such reliable service out of it as was got in 1911 and 1912 by Mr. Handasyde out of the Antoinette engine in the Martinsyde monoplane, where for probably the first time it was in the hands of a man who has a genius for engine-tuning. Just as a great conductor can do far more with an orchestral work than ever its composer can do, so an engine-tuning genius can get more out of an engine than its designer can get.

Still the Antoinette was by far the best engine of its day and it was only replaced by the rotary engine because, aeroplane design and construction being then so primitive and stationary engines being so heavy, owing to lack of knowledge among metallurgists and manufacturers of metals, the queer aircraft of the day could only be persuaded off the ground by a very light engine. The rotary engines, the Gnome, Le Rhône and Clérot, made it possible for a tea-tray to fly and thus it became possible to test any type of aeroplane in the air.

As a result we attained to the moderately efficient aeroplanes of to-day in which we can afford to use heavier engines. Also, increased metallurgical knowledge has made our stationary engines of to-day in many cases lighter than the rotaries of those days. And at the end of it all we are back to the V-type engine of Levasseur and are still seeking the direct injection of fuel with which he achieved some considerable measure of success.

### The Antoinette Monoplane.

Although primarily a designer of engines Levasseur was equally ingenious and equally far in advance of his time as a designer of aeroplanes. He first turned his engineering ability in this direction when he co-operated in the design of the Gastambide-Mengin monoplane in 1907 or thereabouts. M. Gastambide (senior) was concerned in the building of the Antoinette engine, which was in fact named after Madeleine Gastambide, his daughter. When the Gastambide-Mengin monoplane became something of a success it also was named after the same charming lady and soon became the synonym for all that was best and most beautiful in aeroplane design.

The Antoinette monoplane was remarkable in many ways and showed that Levasseur had even in those dark ages ideas which would be considered up-to-date to-day. When it was built other aeroplanes had planes composed of a single surface of fabric. That is to say, the upper and lower surfaces were stuck together. Nobody seemed to realise that the upper and lower surfaces of a plane need have different curvatures.

### High Lift Wings and Streamlining.

Yet even so early in aeronautical history Levasseur produced a machine with planes which would to-day be recognised as very good attempts at a high-lift wing, heavily cambered at the root and tapering to the tip with a very pronounced wash-out, strictly in accord with the practice of the day after to-morrow.

Also the Antoinette was streamlined all over with the greatest care at a time when all other aeroplanes were a mass of struts and wires and excrescences, resembling strongly the flying hen-coops (*cages à poules*) which the French humorists called them. The hull proper was covered with three-ply wood, again in accord with the best modern practice, and the long thin after part was a triangulated wooden frame without any wire bracing and covered with fabric.

### Inherent Stability and Efficiency.

With her pronounced dihedral angle to the wings, tapered and washed out as they were, and with her adequate tail surfaces, the Antoinette was very nearly an inherently stable aeroplane, if not absolutely so. At any rate her most famous

plot, the late Hubert Latham, used to fly for quite long stretches without touching the controls.

Some idea of the efficiency of the machine even in the early days of 1909 may be gathered from some figures of "Antoinette IV" on which Latham ultimately fell into the Channel almost inside Dover Harbour. This machine had a span of 40 feet, and an over-all length of 37 feet, with a wing area of 300 square feet. She weighed 1,000 lbs. empty. Ad pilot and petrol and you have something like 1,250 lbs. flying well with a problematic 50 h.p., at a speed of about 50 miles an hour. Which considering all things was no mean performance.

#### Metal and Variable Airscrews.

It is further of interest to note that the original Antoinette airscrews were made of metal with variable pitch. The blades were of aluminium bolted to steel tubes, which tubes could be twisted in their attachment to the boss so as to vary the incidence of the blades. It is true that the blades were crudely formed and hardly in accord with modern aerofoil design, but they did nevertheless constitute a metal airscrew, an article with which we are still experimenting.

Also, Levassieur recognised the fact, which many designers still do not, that the inner half of an airscrew from the centre outwards does no useful work. So his blades only existed on the outer half, and the inner half was just plain tube. True he omitted to streamline that piece of tube, but even so one doubts whether it wasted as much power as does the chunk of useless timber which encumbers most airscrew bosses.

It seems quite possible that some day when metal airscrews are developed as they should be we may come back to something which looks at first sight very like the curious metal paddles on the older Antoinettes.

#### The End of the Antoinettes.

What killed the Antoinette type was the awkward control, which Levassieur refused to alter, and the breaking of a number of wings in the air with fatal results. Pilots refused to fly a machine which, though a delightful flying machine, was controlled by an altogether unnatural operation of wheels. Nobody was ever killed through the controls arrangement, but pilots who had learned to fly with an ordinary "stick" control refused to learn all over again. And later on when skilled pilots like Charles Wachter, Lafon, and the Comte de Rolland had been killed through their wings collapsing in the air nobody could be found to fly the machines which remained and the Antoinette firm ceased to exist.

The breakage of the wings was due rather to over-estimating the strength or reliability or durability of the material than to any defect in design, and other capable engineers besides Levassieur have made similar mistakes, all the way from the designers of the Quebec Bridge to the designers of R.38, not to mention numerous aeroplane designers of all nations. Therefore it is all the greater pity that money was not forthcoming to continue the development of an aeroplane which was in its main features many years in front of its time.

The last Antoinette ever built was that produced for the French Military Trials of 1913. It was the last word in streamlining, and the streamlined "pantalons" over the undercarriage and wheels caused endless joy to the aeronautical community. One cannot recall her dimensions or weight, but one remembers very well that though she did not fly well, she did get off the ground with an apparently impossible weight on an absurdly low engine-power.

Moreover she was a cantilever monoplane, in general appearance not unlike the Junkers monoplanes of to-day. Which in itself is a remarkable instance of engineering foresight.

Had it been financially possible to continue experimenting along the same lines the French Army would have had at the outbreak of war in 1914 an aeroplane just about as efficient as anything in the possession of any Air Force in the World to-day. But the money was not obtainable and so the Antoinette disappeared and Levassieur ceased to interest himself in aviation.

#### His Last Appearance.

What use was made of his genius during the war one does not know. He only re-appeared for an all-too-brief instant in aeronautical history last year when in co-operation with M. Gastambide (Junior), the son of the originator of the Antoinettes, he produced a very interesting biplane with variable-surface wings. The scheme of operating the surfaces was simple yet ingenious and should well repay further experimentation.

Little has been heard or seen of this machine, but it is said that it flew satisfactorily. Therefore it is earnestly to be hoped that those who were concerned with Levassieur in its inception will continue the work, if only so that if it should prove successful the World may have a true aeronautical memorial of one of the greatest intellects ever concerned with aviation.

One believes that as with most geniuses it was difficult to work with Levassieur. He did not mind criticism of his work, for he was well able to maintain his own position in a technical argument. But, like so many other brilliant designers and inventors, he would not allow the people who put up the money to decide when inventing was to stop and when mere commercial production should begin. Also, as in the case of the perfectly hopeless control gear of the Antoinette monoplane, he would not alter a detail which did not in the least affect his aerodynamic or constructional scheme in order to make an unsaleable article into a marketable commodity.

Those were primarily the causes of the failure of what ought to have been the most popular aeroplane in the World, and one which would have advanced by many years the progress of aviation. Nevertheless the fact remains that Levassieur was far ahead of his time as a designer of aeroplanes and aero-engines.

#### A Reminiscence.

Personally he was a singularly likeable personality. He was a short, thickest man with a heavy brown beard and stiff coat, and had the general appearance of a benevolent hen. One remembers with gratitude an afternoon in July, 1909, spent with him on the cliffs at Sangatte when Hubert Latham was waiting to fly the Channel on "Antoinette IV." With infinite patience and good humour, and considerable ingenuity, he contrived to understand one's execrable French and to give one in language skillfully adapted to the ignorance of his hearer a quantity of information concerning the features of "Antoinette IV" and the differences between her and "Antoinettes" V and VI, which were then being built at Châlons. His kindness even extended to making sketches of the machines for this humble English journalist.

Afterwards one wrote of him,—"He is a man of peculiar charm of manner, never didactic, but always convincing, courteous in a bluff, hearty way, and possessing a quiet fund of humour. He is eminently a man to inspire confidence in those who have dealings with him." To that opinion one still adheres after nearly thirty years. If those who first had confidence in his genius had been able to continue his work or had been able to induce others to back his designs France might well be to-day much further advanced in aircraft and aero-engine production. And even as events occurred the history of aviation and the progress of aircraft owes much to Levassieur.—C. G. G.

## ENCOURAGEMENT.

Aviation both Service and Civilian in Britain has from the beginning had reason to complain of the lack of intelligent interest in its possibilities shown by the general public, and of the futile and harmful manner in which the sensation-loving general Press has dealt with its affairs.

It is therefore highly gratifying to find that during the past few days the daily Press has given to the serious problems of air defence quite a large amount of space, and has dealt with those problems in a fittingly serious manner.

During the past week the *Times* has published a series of articles, entitled "Our Future in the Air," by Brig.-Gen. P. R. C. Groves (late R.A.F.), which extend to nearly nine columns in total, and has in addition reiterated the leading conclusions of those articles in a half-column "leader." Sir Percy Scott has returned to his attack on the battleship in the same journal, and despite the, unintentional humour of

his efforts will doubtless help the uninformed to realise the importance of Air Power in naval warfare.

The *Observer* of March 26th, and the *Glasgow Evening News* of March 25th, in leading articles emphasise the danger of Air attacks to which Britain is exposed in the present state of affairs, and call for the organisation of adequate Air Defences.

And the *Daily Telegraph*, during the same week, has published a set of articles by Major C. C. Turner, descriptive of a visit to Germany, and showing how seriously Germany is determined to develop such Air Power as is possible to her in the future.

The evidence is overwhelming that the Press is awakening to the fact that in the next great war Air Power, so far as Britain is concerned, will probably—almost certainly—be the decisive factor, and that our present Air Force must be



greatly strengthened in the near future if safety is to be maintained.

Gratifying as this evidence must be to all who have the real interests of the Royal Air Force at heart, it is necessary to again issue a warning against the fallacy which seems to be current among all these new-found and zealous converts to a belief in the future of Air Power, as well as among many who might be expected to know better.

This is the fallacy that the defence of Britain in the air may be safely entrusted to a force mainly composed of subsidised civil aircraft, manned by subsidised commercial crews, and led by a small nucleus of trained Air Force officers.

The danger which faces Britain in the case of Air attack is that of a colossal air raid on a scale adequate to paralyse her internal organisation, carried out with little or no warning of what is impending.

Such an attack might be met in one of two ways only. It might be fought off in the air over the seas around Britain, or it might be anticipated, and prevented by counter raids on the enemy aircraft bases.

Unless it is to be our future policy that we shall at once attack any Power which shows signs of building an Air Fleet sufficiently powerful to attack Britain, our only chance of striking first in such an event will be to possess an Air Force of a very high standard of efficiency and preparedness ready to operate at the first certain news of enemy preparations for attack.

If we are to depend on a Civil Air Fleet for the mass of our Air Power, the advantage in time will lie always with the original aggressor, for he will choose his own time.

## R.A.F. INTELLIGENCE.

From the *London Gazette*, March 10th.—R.A.F.—Air Vice-Marshal Sir W. G. H. Salmond, K.C.M.G., C.B., D.S.O., is appointed Director General of Supply and Research, Air Ministry, vice Air Vice-Marshal Sir E. L. Ellington, K.C.B., C.M.G., C.B.E. (Feb. 23rd).

### R.A.F. Appointments.

Air Vice-Marshal J. F. A. Higgins, C.B., D.S.O., A.F.C., from H.Q., I.A. (on ceasing to be attached to the Air Ministry) to R.A.F. Depot (I.A.) (Supernumery). Whilst attending R.N. Staff College for Senior Officers' War Course. 7/3.

Wing/Cmdr. N. Goldsmith, O.B.E., from Aircraft Depot, Egypt (Supernumery). 15/3.

S/Ldr. G. H. Bowman, D.S.O., D.F.C., from R.A.F. Depot (I.A.), to command No. 8 Sqn. (Iraq Group). 24/2.

The following Officers to the R.A.F. Staff College (I.A.), 3/4—

S/Ldr. J. S. Douglas, M.C., D.F.C., from No. 6 F.T.S. (I.A.); C. W. H. Pulford, O.B.E., A.F.C., from R.A.F. Base, Gosport (Development Flying Wing) (Crawwell); B. E. Smythies, D.F.C., from No. 3 F.T.S. (I.A.); W. A. McClaughry, D.S.O., M.C., D.F.C., from Air Pilotage School (Cadre) (I.A.); L. L. Maclean from No. 2 F.T.S. (I.A.); K. R. Park, M.C., D.F.C., from School of T.T. (Men) (I.A.); E. B. C. Mirts, D.S.C., D.F.C., from R.A.F. Depot (I.A.); J. B. Cole-Hamilton from Boys' Wing (Crawwell); G. M. Lawson, M.C., from Armament and Gunnery School (Cadre) (I.A.); H. S. Kerley, D.S.C., A.F.C., from No. 1 School of T.T. (Boys) (Haltom); W. B. Farrington, D.S.O., from H.Q., R.A.F., Crawwell; W. R. Dyke Achard, D.F.C., A.F.C., from H.M.S. *Arenis* (C.A.); C. H. Hayward from R.A.F. Depot (I.A.); N. W. Wadhwa from R.A.F. Base, Leuchars (C.A.); R. M. Drummond, D.S.C., M.C., from School of Army Co-operation (I.A.); E. B. Bennman from No. 10 Group H.Q. (C.A.); H. S. Powell, M.C., from No. 11 Wing H.Q. (I.A.).

S/Ldr. J. T. Rabbington, D.S.O., from No. 6 F.T.S. (I.A.), to R.A.F. Depot (I.A.). 3/4.

S/Ldr. J. V. Steel, O.B.E., from R.A.F. Depot (I.A.) to School of T.T. (Men) (I.A.). 20/3.

S/Ldr. G. E. E. Burt, D.S.C., from No. 25 Sqn. (I.A.) (C.A.) to R.A.F. Depot (I.A.). 14/3.

S/Ldr. J. C. M. Lowe from Air Ministry (Dir. Gen. of Supply and Research) to Air Ministry (Dir. of Operations and Intelligence). 6/3.

F/Lt. J. H. O. Jones, from No. 210 Sqn. to R.A.F. Base, Gosport (Observers' Training Flight) (C.A.). 1/3.

F/Lt. G. C. Brown, O.B.E., A.F.C., from Observers' Training Flight to R.A.F. Base, Gosport 210 Sqn. (C.A.). 1/3.

F/Lt. G. E. Wilson from Half-pay List to No. 3 F.T.S. (M.E.A.). 24/2.

F/Lt. E. S. Goodwin, A.F.C., from Marine and Armament Experimental Establishment (I.A.) to No. 26 Sqn. (M.E.A.). 23/2.

F/Lt. A. Coningham, D.S.O., M.C., D.F.C., from C.F.S. (I.A.) to No. 55 Sqn. (Iraq Group). 24/2.

F/Lt. C. P. E. Bartlett, D.S.C., from Half-pay List to No. 30 Sqn. (Iraq Group). 24/2.

F/Lt. H. M. Masscy, M.C., from No. 39 Sqn. (I.A.) to No. 8 Sqn. (Iraq Group). 24/2.

F/Lt. F. N. Hutton, M.C., from R.A.F. Cadet College (Flying Wing) (Crawwell) to No. 6 Sqn. (Iraq Group). 24/2.

F/Lt. R. A. Courtney, M.B.E., from No. 11 Wing H.Q. (I.A.) to H.Q. (Iraq Group). 24/2.

F/Lt. J. H. D'Albiac, D.S.O., from No. 4 F.T.S. (M.E.A.) to No. 47 Sqn. (M.E.A.). 15/2.

F/Lt. F. R. Alford, M.C., from No. 10 Group H.Q. (C.A.) to Armament and Gunnery School (Cadre) (I.A.). 6/3.

F/Lt. H. S. Shields, M.C., from No. 208 Sqn. (M.E.A.) to R.A.F. Depot (I.A.). (Supernumery). 8/2.

F/Lt. R. E. Daniel from Air Ministry (Dir. of T. and O.) to R.A.F. Depot (I.A.). (Supernumery). 5/3.

F/Lt. E. B. C. Betts, D.S.C., D.F.C., from H.M.S. *Pegasus* (Mediterranean Group) to R.A.F. Depot (I.A.). (Supernumery). 28/2.

F/Lt. H. G. White from No. 1 School of T.T. (Boys) (Haltom) to No. 4 Sqn. (I.A.). 15/3.

F/Lt. D. H. Dabbs from No. 6 F.T.S. (I.A.) to No. 4 F.T.S. (M.E.A.). 21/3.

F/Lt. G. A. Pirie, M.C., D.F.C., from R.A.F. Depot to School of Army Co-operation (I.A.). 10/3.

If it be a question of fighting off an attack already on its way, it is at least equally important that our defensive forces should be highly trained and instantly available for service.

Nothing but an adequate and regular Air Force will meet either of these cases.

The present Royal Air Force is not large enough to secure safety in the near future. It is equipped almost entirely with obsolete aircraft.

Safety demands that every farthing that can possibly be spared shall be spent directly on the R.A.F., and in the first place on equipping and continually re-equipping that Force with the best and most modern machines and equipment.

Even if the size of the R.A.F. were not greatly increased such a policy would lead to a healthy and prosperous Aircraft Industry, and that Industry could safely be trusted to apply some of its profits to the improvement of aircraft for civilian purposes.

If they were allowed to carry on such development freely and at their own initiative, commercial aircraft would rapidly arrive at a stage when commercial aviation would become real commerce, a condition likely to be long delayed if the development of civil aviation is to be controlled by Government officials, who at the best will be influenced by the potential value of civil aircraft for war, and at the worst—which is the most probable—will neither know the commercial nor the military qualities which are requisite to either employment.

Thus a sound Military Air Policy may be trusted to produce a sound Civil Industry—whereas the policy now being preached in the daily news sheets will lead merely to disaster for both branches of aviation.—W. H. S.

S/Ldr. T. W. Elsdon, from No. 29 Group H.Q. (C.A.) to R.A.F. Depot (I.A.). (Supernumery). 3/4.

S/Ldr. D. Harries, A.F.C., from R.A.F. Airship Base to H.Q. (C.A.). (Supernumery). Pending closing down of R.A.F. Airship Base. 24/2.

S/Ldr. H. C. Fuller, from R.A.F. Airship Base to H.Q. (C.A.). (Supernumery). To remain attached to Pulham Airship Station. 24/2.

S/Ldr. P. Balington, M.C., A.F.C., from Egyptian Grp. H.Q. (M.E.A.) to R.A.F. Depot (I.A.). (Supernumery). 3/3.

F/Lt. H. H. McLeod Fraser, from C.F.S. to School of Photography (I.A.). (Supernumery). 3/4.

F/Lt. D. W. Clapen, from C.F.S. to School of Photography (I.A.). (Supernumery). 3/4.

F/Lt. E. N. E. Waldron from Central Pay Office (I.A.) to No. 4 Stores Depot. 20/3.

F/Lt. A. L. Ncale, M.C., from R.A.F. Depot to No. 1 Sqn. (I.A.). 15/3.

F/Lt. R. O. Jamison, D.S.C., D.F.C., from R.A.F. Depot (I.A.) to No. 1 School of T.T. (Boys) (Haltom). 15/3.

F/Lt. H. Carmichael Irwin, A.F.C., from R.A.F. Airship Base to R.A.F. Base, Leuchars. 15/3.

F/Lt. W. A. Kingston, from R.A.F. Airship Base to H.Q. (C.A.). (Supernumery). Pending closing down of R.A.F. Airship Base. 24/2.

F/Lt. S. Nixon, O.B.E., from R.A.F. Airship Base to H.Q. (C.A.). (Supernumery). To remain attached to Pulham Airship Station. 24/2.

F/Lt. J. E. M. Abberley, from R.A.F. Depot to Armament and Gunnery School (Cadre) (I.A.). 24/3.

F/Lt. H. V. Drury, A.F.C., from R.A.F. Airship Base to No. 10 Grp. H.Q. (C.A.). 15/3.

F/Lt. L. Whitworth, A.F.C., from R.A.F. Airship Base to R.A.F. Depot (I.A.). 15/3.

F/Lt. H. H. Gunn, from R.A.F. Depot to Armament and Gunnery School (I.A.). 3/4.

F/Lt. J. F. Roche, from Instrument Design Establishment to Experimental Section R.A.E. 1/4.

AIR MINISTRY, March 22nd.

Grp/Capt. U. J. D. Bourke, C.M.G., from Half Pay List to command I.A.A.D. 10/4.

Wing/Cmdr. J. C. Halahan, C.B.E., A.F.C., to command R.A.F. School (India). 10/2.

S/Ldr. A. C. Winter, O.B.E., from No. 24 Sqn. (I.A.) to No. 4 F.T.S. (M.E.A.). 10/2.

S/Ldr. M. G. B. Copeman, from Armament and Gunnery School (Cadre) (I.A.) to H.Q. (M.E.A.). (Supernumery). To command No. 2 Armoured Car Co. (on formation). 10/3.

S/Ldr. R. T. Henry de Koeper, A.F.C., from School of Photography to No. 12 Sqn. (I.A.). 20/3.

S/Ldr. J. T. Whittaker, M.C., from R.A.F. Depot (I.A.) to command No. 28 Squadron (India). 7/3.

S/Ldr. H. E. L. Watkins, A.F.C., from Seaplane Training School (C.A.) to H.Q. Iraq Group. (Supernumery). To command R.A.F. Rest Camp (on formation). 7/3.

S/Ldr. F. C. Williams, O.B.E., from No. 4 S.D. to H.Q., Iraq Group. (Supernumery). 7/3.

S/Ldr. W. Shillet, from H.Q., I.A. to H.Q., Iraq Group. (Supernumery). 7/3.

S/Ldr. C. S. Wynne-Eyton, D.S.O., from H.Q., No. 11 (Irish) Wing to H.Q. R.A.F. Ireland. 17/2.

F/Lt. C. B. Cooke, from I.A.A.D. (I.A.) to Aircraft Depot (India). 7/3.

F/Lt. A. P. V. Daly from School of T.T. (Men) (I.A.) to No. 60 Sqn. (India). 7/3.

F/Lt. A. T. Williams, from Boys' Wing (Crawwell) to H.Q., Iraq Group. (Supernumery). 7/3.

F/Lt. C. Leckie, from R.A.F. Cadet College (Flying Wing) (Crawwell) to H.Q., Iraq Group. (Supernumery). 7/3.

F/Lt. E. L. Ardley, from No. 27 Sqn. (India) to No. 1 Wing H.Q. (India). 20/2.

F/Lt. A. L. Shuter, M.C., D.F.C., from No. 5 F.T.S. (I.A.) to No. 4 F.T.S. (M.E.A.). 8/3.

F/Lt. F. M. Roper, from Aeroplane Ex. Est. (C.A.) to H.Q., Iraq Group. 7/3.

F/Lt. W. R. Cox, M.C., A.F.C., from R.A.F. Cadet College (Flying Wing) (Crawwell) to H.Q., Iraq Group. 7/3.

F/Lt. C. F. Horsley, M.C., from No. 24 Sqn. (I.A.) to H.Q., Iraq Group. 7/3.

F/Lt. H. B. Russell, A.F.C., from No. 39 Sqn. (I.A.) to H.Q., Iraq Group. 7/3.

AIR MINISTRY, March 17th.

S/Ldr. G. Blatherwick from C.F.S. to School of Photography (Inland Area). (Supernumery). 3/4.

F/Lt. H. E. P. Wigglesworth, D.S.C., from R.A.F. Depot to I.A.A.D. (I.A.). 20/3.  
 F/Lt. H. J. Roach, A.F.C., from R.A.F. Depot (I.A.) to No. 1 School of T.T. (Boys) (Haltom). 20/3.  
 F/Lt. H. G. Bowen, from R.A.F. Depot (I.A.) to Half Pay List. Pending embarkation overseas. 13/3.  
 F/Lt. H. V. Jerrard, from Half Pay List to R.A.F. Depot (I.A.). (Superannuary). 20/3.  
 F/Lt. N. S. Douglas from Egyptian Grp. H.O. to No. 36 Sqdn. (M.B.A.). 19/3.  
 F/Lt. L. Wanless-O'Gowan, from Staff of Military Attache, Tokio, to R.A.F. Depot (I.A.). (Superannuary). 17/1.

### Iraq.

The Air Ministry announces that Sir Percy Cox, High Commissioner of Iraq, made his first inspection by air of part of the country lying along the Euphrates on March 21st, when he visited Fahad Beg Ibn Hadhdhal, Sheikh of Amarat, at his Headquarters about 30 miles N.W. of Hit. He was accompanied by his staff and an R.A.F. Guard of Honour.

The party left Baghdad in three Vickers "Vernon" machines, one of which also carried stores for armoured cars, with an air escort of 12 machines. The Amarat, who are well armed and number 5,000 rifles, range the eastern half of the Hamad as far north as Dair az Zaur. The tribe is regarded as friendly to the British. The effect of the visit and the demonstration of air power by the assembled aircraft and of machine-gun fire by armoured cars, which were also present, is reported to have been very impressive.

The flight, which covered about 300 miles out and home, partly following the course of the Baghdad-Cairo air line, was accomplished successfully on the day of the inspection by the 15 machines engaged.

The Vickers "Vernon" machines which were used for conveying the official party are two-engined troop-carrying aeroplanes that have been sent recently to Iraq to augment the air units stationed there and are destined to take an important part in the garrisoning of this vast territory when it comes entirely under Royal Air Force control.

The machine is capable of carrying a load of nearly 2 tons and can accommodate 12 persons, with full military equipment in addition to the pilots, water, and food supplies.

The visit is regarded as a useful illustration of the policy of policing the country by aircraft at comparatively small cost and of the strong moral effect which air power can produce without having to maintain local garrisons and long lines of communications.

## R.A.F. SPORTS AND PASTIMES.

### Golf.

The R.A.F. Golfing Association held their Spring meeting at Porters Park on March 22nd and 23rd. Inter-station team matches were played in the morning of the 22nd and in the afternoon there was a better ball competition. The leading returns were:—

Haltom "A."—S/Ldr. E. W. Norton (13), S/Ldr. W. W. Shorten (13), and F/Lt. F. H. Sims (12), 6 up.

Uxbridge "A."—Wing/Cmdr. P. H. Wise (9), F/Lt. C. H. Hayward (plus 2), and F/Lt. H. H. Clarke (5), 5 up. Uxbridge "C."—F/O. A. F. Ingram (18), F/Lt. E. A. Fawcus (4), and F/Lt. J. C. Cooke (10), 1 up.

Ruislip "A."—Wing/Cmdr. W. Pryce (24), F/O. E. A. Burridge (13), and S/Ldr. Steele Perkins (14), 1 up. Ruislip "B."—F/O. W. Badley (18), F/O. E. N. Edwards (18), and F/O. W. Halliwell (18), 1 up.

Coastal Area H.O.—A.V.M. A. V. Vyvyan (14), S/Ldr. G. H. Thomson (scratch), F/Lt. C. A. Shaw (14), 1 up.

Air Ministry.—S/Ldr. J. Hewitt (18), A. C. R. D. Munro (scratch), and Wing/Cmdr. K. G. Brooke (9), 1 up.

Eastchurch.—S/Ldr. H. Carr (15), F/Lt. R. S. Capon (18), and F/Lt. A. McR. Moffatt (12), all square.

Afternoon.—F/O. W. Badley (18) and Wing/Cmdr. W. Pryce (24), 2 up. S/Ldr. E. W. Norton (13) and S/Ldr. Shorten (13), 1 up. F/Lt. A. E. Barr-Sim (scratch) and F/Lt. E. A. Fawcus (4), 1 down. F/Lt. A. Lees (5) and F/O. W. L. Fennick (10), 1 down. F/Lt. R. S. Capon (18) and S/Ldr. W. Carr (17), 1 down. Grp/Capt. A. D. Warrington Morris (10) and F/Lt. D. N. Williams (5), 1 down. F/O. W. Halliwell (18) and F/O. E. N. Edwards (18), 2 down. S/Ldr. G. M. Reid (5) and F/Lt. F. H. Sims (12), 3 down. Wing/Cmdr. P. H. Wise (9) and F/Lt. C. H. Hayward (plus 2), 3 down.

The following day play took the form of a 36-holes eclectic competition under handicap against bogey. There were two divisions. The first included players with handicaps up to 10 inclusive, and the second players whose handicaps were 11 and over. F/Lt. J. H. Porter (6) won in the first division with a return of 4 holes up, and F/O. N. Badley (18) won the second division prize with a return of 5 holes up.

### Cross Country.

The R.A.F. Cross-Country Championship was decided on March 15th at Uxbridge over a 5½ mile course. The team championship was won by No. 3 Section, Haltom, by 40 points. There were 28 teams competing, and 250 competitors. The

individual championship was won by Cpl. O. C. Clarke, of Haltom.

### Inter-Services Cross Country.

The first Inter-Services Cross-Country Championship was decided at Uxbridge on March 27th over a seven miles course in the Hillingdon district. There were 24 runners, eight in each team, and the result was:—R.A.F., 30 points; 1, Army, 51 points; 2, R.N. and Marines, 95 points; 3,

The first six to finish were:—(1) Signaller Cottrell (Army), 37m. 22s.; (2) F/O. Hawtrej (R.A.F.), 37m. 35s.; (3) Gunner Clouting (Army), 38m. 12s.; (4) F/O. Watson (R.A.F.), 38m. 32s.; (5) AC. Clarke (R.A.F.), 38m. 51s.; (6) F/O. Pyper (R.A.F.), 39m. 58s.

### Bircham Newton.

SOCCER.—On March 8th 207 Sqdn. played a friendly match against the Norfolk Wanderers and were beaten by 3 goals to nil. The high wind did not spoil what was a very good game.

On March 11th the 1st eleven played at home against Ingoldisthorpe and won by 5 goals to nil. This was one of the best games of the season. All the goals were scored in the second half.

On the same day the 2nd eleven were beaten by Massingham 3—0.

HOCKEY.—Hockey has started and the Squadron hope to get some matches before the end of the season.

### Eastchurch.

Officers and airmen are joining the Armament and Gunners School daily, and our prospects for the Summer seem very good.

SOCCER.—Our first eleven met the R.N. Depot, Chatham, in the final of the Olympia Cup at Chatham on March 1st. Weather was rather against good football, as it rained in torrents the whole ninety minutes. Cpl. Ross, our goalkeeper, played a brilliant game. Result, R.N. Depot 4, A.T.G.S. (Crone) 1. We have second place in the Sheppey League, and a prospect of winning the Championship.

CROSS-COUNTRY RUNNING.—The run for the Individual Cross-Country Championship was held on March 4th over a four-mile course, AC. Dyer, a new arrival, being first man home. A team is being trained for the Championship run at Uxbridge on March 15th.

GOLF.—A nine-hole golf course has been laid out, and is on the way to perfection, work being carried out under the President, F/Lt. R. S. Capon, and we are hoping to send at least two teams to the R.A.F. Spring Meeting at Porters Park.

SQUASH RACQUETS.—S/Ldr. A. G. H. Carr, O.B.E., has been elected President of a Squash Racquets Committee, and at present is busily engaged driving buses from their nesting places in the squash racquet court. Matches have been arranged with the Officers of the R.A.F., Isle of Grain.

CINEMA.—The Station Cinema was re-opened on March 7th under new management. A very fine programme was shown, including a Chaplin film; thanks are due to F/O. F. N. Brookman. During the interval the C.O., Wing-Cmdr. A. W. Bigsworth, C.M.G., D.S.O., A.F.C., made a very pleasing speech, in which he appealed to all ranks to assist him in the promotion of Airmen's Recreation. He also presented a silver cup to the winner of the cross-country race.

BAND AND ORCHESTRA.—Weird strains of musical instruments have been heard emanating from the vicinity of the Airmen's Recreation Room; these, we are informed, are due to the untiring efforts of our Pay Officer, F/O. E. K. Greenwood, M.C., who will shortly be coming out as a conductor—not on a bus.

### Flowerdown.

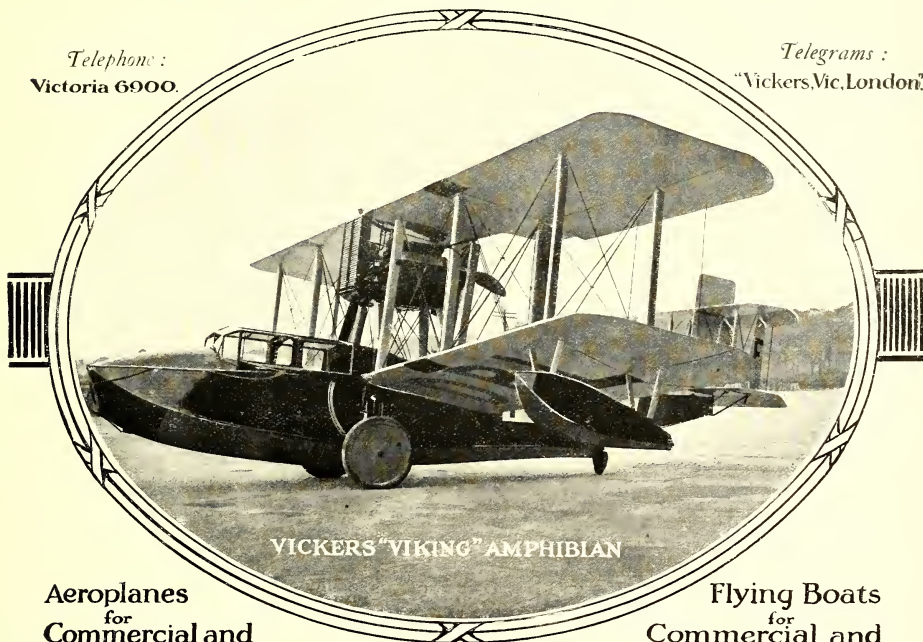
RUCCER.—At Winchester on March 3rd, Flowerdown beat Uxbridge in the semi-final tie of the R.A.F. Rugger Cup, the final scores being Flowerdown 7 points (1 dropped goal and 1 try), Uxbridge 3 points (1 try). Kicking off with the wind behind them the home team immediately became dangerous, and play was transferred to the visitors' twenty-five. After twelve minutes of concentrated excitement Sugden secured and passed cleverly to Vale, who dropped a perfect goal. The pace, fast before, now became terrific, and some clever work by the visiting three-quarters sent their forwards helter-skelter towards the home line. F/O. Storrs made a brilliant dash along the left wing and sent the hearts of the home spectators into their mouths. He was, however, brilliantly tackled and brought down by Butcher when he seemed a certain scorer. It was a perfect tackle and deserved the frenzied yells of relief which it evoked.

Play was again transferred to the visiting half, and time and time again it seemed as if Flowerdown must add to their lead, but the visiting defence was sound and half-time arrived without any further score.

With the wind behind them the visitors began to press in the second half and the home defence had an anxious few minutes. Then came a wonderful break-away from a clearance by Vale, the home forwards following up closely get

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5 Passengers or  
750 lbs. Freight.

RANGE: 480 miles.

SPAN: 46' 0"

HEIGHT: 15' 1"

LENGTH: 33' 5"

The Vickers Viking was classified **FIRST** in the following competitions at the **INTERNATIONAL SEAPLANE COMPETITIONS** at **ANTWERP, July 1920**

1. Shortest time in "unsticking" from water.
2. Fastest time over a given circuit
3. Climb to 1,000 metres
4. Altitude with full load

**Brief Specification:**

**Viking Mark IV**

5 Passengers or  
1,250 lbs. Freight.

RANGE: 480 miles.

SPAN: 50' 0"

HEIGHT: 15' 1"

LENGTH: 35' 0"

**Depots**

**MANCHESTER:** Millgate Buildings,  
Long Millgate.

**BIRMINGHAM:** Vickers House,  
Loveday Street.

**NEWCASTLE:** Commercial Union  
Buildings, Pilgrim Street.

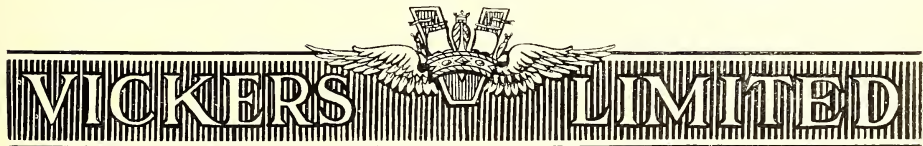
**GLASGOW:** Vickers House, 247,  
West George Street.

**BRISTOL:** 55, Park Street.

**BELFAST:** 26A, Arthur Street.

**LEEDS:** Greek Street Chambers,  
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their feet to the ball and breaking clear through scored a try right between the posts. It was impossible to say, with any certainty which of the writhing heap of home forwards actually touched down, but the ball was eventually unearthed from beneath about five of them. Cracknell, unfortunately, failed to convert, the strong wind carrying the ball wide of the uprights.

Then followed a period of awful suspense for the home team, for the visitors, following up a free kick, got over and scored the second try of the match. The kick was not an easy one and great was the relief when the ball sailed merrily past on the wrong side of the sticks.

Again and again the visitors pressed, and pinning the home team within some ten yards of their own line for about a quarter of an hour, well-nigh reduced the home spectators to a state of nervous collapse. However, the defence rose to the occasion and eventually relieved the pressure, play being transferred to mid-field.

The last agonising moment came some ten minutes from time when the visitors were awarded a free kick for off-side. Storrs took the kick and only just failed to convert. It was a real good effort, and deserved a better fate. The home side once more took up the attack and the final whistle found them pressing strongly.

P.S.—It has just been ascertained that the under-dog when Flowerdown scored their try was Jervis, and so the premier honour goes to him.

The teams were:—Flowerdown, F/Lt. F. L. C. Butcher; S/Ldr. A. L. Gregory, M.B.E., M.C., AC2 F. Cracknell, AC2 J. M. Wale, Mr. Mutch, M.C., M.A.; F/Lt. R. S. Sugden, A.F.C., AC2 J. Brooks; Grp/Capt. A. D. Warrington-Morris, C.M.G., O.B.E., F/Lt. A. J. Long, P.O. W. A. Duncan, AC2 J. McIndoe, M.B.E., AC2 W. F. Young, AC2 H. W. Jervis, AC2 J. Jevison, AC2 S. G. Collins.

Uxbridge, AC1 J. Wood; F/O. H. H. Storrs, F/Lt. J. C. Russell, D.S.O., P/O. C. L. Falconer, S/M. Bradbury; P/O. R. W. Pontifex, F/O. R. C. Clayton; S/Ldr. W. C. Higgs, A.F.C., P/O. P. H. Davy, F/Lt. H. C. Todd, F/O. S. D. Macdonald, D.F.C., F/O. G. H. Vasse, Sjt. Stevens, AC2 Godding.

### Gosport.

SOCCER.—"A" Team's record to date is: In the United Services League, Division I, Position 2nd. Played 18, won 8, drawn 3, lost 7. Goals: for, 33; against, 26. Points 19.

In the United Services Charity Cup we lost in the 2nd round to R.M.L.I. (Forton) on their ground 2-1.

R.A.F. Cup. Lost to Henlow "A" in the 4th round at Uxbridge by 4-1.

"B" Team: In the Gosport and District League, Division I, Position 5th. Played 12, won 5, drawn 2, lost 5. Goals: for, 20; against, 23. Points 12.

Gosport Hospital Cup (Junior) in semi-final.

RUGGER.—Rugby Team's Record: Played 11, won 8, drawn 1, lost 2. Goals: for, 234; against, 58.

It is significant to note that the two games lost have been against R.A.F., Flowerdown, who put us out of the R.A.F. Cup by a dropped goal and penalty try. (Better luck next season.)

HOCKEY.—Hockey Team's Record: Played 3, won 3, drawn 0, lost 0. Goals: for, 11; against, 5.

We are now awaiting the next draw of the R.A.F. Hockey Cup.

CROSS-COUNTRY RUNNING.—Training is now in full swing as is also the "Jug-o'-war" training.

### Sport in Iraq.

December has been a very busy month as regards sport of all kinds, including Racing, Rugby and last but not least Soccer.

The Baghdad Football League has brought forth some very interesting matches of late, and the league table shows that the Air Force clubs are well up. The usual ding-dong struggles have taken place during the last month, especially when the Air Force teams are opposed to Army formations. The Group team which I think is the smallest made team in the league has had the honour of inflicting the only defeats on the British Club (last year's champions) and the Artillery, and with their good play at present and a little luck they should finish in the first three of the table.

On Dec. 31st the final of the "Overland Cup" was played at Baghdad between the Aircraft Park and the Norfolk "A" team which is known better as the Regimental Team, and after a terrible struggle, including the exchanges in the extra time, played a draw of one goal each.

The replay took place at Baghdad on Jan. 14th, before even a larger attendance than before in glorious weather, and after being a goal down at half time, and missing a penalty in the second half, the Air Force ran out winners by two goals to one and certainly deserved their victory.

Early March should see some good football, as there is the Iraq Cup Competition in which practically all the league teams will take part, and if the Group team are fortunate

enough not to be drawn against the British Club as they were in the Overland Cup they will go far.

The R.A.F. in Iraq were beaten at Rugby by 30 points to 3 by the combined United Services Club and Baghdad Players, but with a little practice the Air Force hope to be able to improve upon this result in the future.—IRAGQIAN.

### 28 Squadron, Kohat.

SOCCER.—On Feb. 18th 28 Sqdn. played the 1st Bati Border Regt. on the Gynklama Ground. The match resulted in a goalless draw. In the first half the Border Regt. ran through several times but the attacks were broken up by the R.A.F. backs, ACs. Shipley and Marshall. The Air Force played a better game in the second half but some passes by the wing men were missed, the forwards being rather weak in front of the goal. Special mention should be made of AC. Jones, the Air Force goalkeeper, and L/AC. Raby and AC. Geekie.

### Martlesham.

SOCCER.—The teams have done well since our last notes, having reached the semi-final of the Suffolk Senior Cup, by beating the R.F.A. 2-1, St. Mary Elms O.B. 2-1, and Orwell Works 4-0, and they will meet the Old Nacs in a replay for admission to the semi-final of the Charity Cup.

Stowmarket, our old rivals, entertained the team on Feb. 4th, and as usual a great game was witnessed. Unfortunately AC. Rowbottom was crocked in the first five minutes and L/AC. Beaumont had to be carried off during the latter stage, but as the result was only 3-2 against, it can be judged that play was very keen.

HOCKEY.—The team journeyed up to Leuchars to play them in the 2nd round Hockey Challenge Cup, but to their great disappointment, on arrival there was three feet of snow, and although they waited for two days, no play was possible.

On the re-draw, they will play Cranwell at Cranwell. BILLIARDS.—The Station Billiard Handicap, open to all ranks, was finished at the end of January and won by F/O. H. C. Pierce with F/Lt. Hay runner up. The Challenge Cup was duly filled.

### Balloon School, Rolleston.

SOCCER.—Jan. 7th.—St. Edmund's v. Balloon School. At Salisbury, on a slippery ground the Balloon School played with seven reserves and were able to outplay the Saints to the tune of 3-1.

Jan. 11th.—No. 1 E.T.S. Netheravon v. Balloon School, at Rolleston Camp. The Netheravon team was more or less a scratch one owing to the fact that the School team were playing their round in the R.A.F. Cup. After a very stern struggle the game ended with the score sheet showing two goals each.

Jan. 11th.—Shrewton v. Balloon School. Great interest was shown in this "local Derby" at Rolleston Camp. The Balloon School still playing with five reserves put up a good fight and the interval arrived with a blank score sheet; the greater height of the Shrewton team was a big advantage, and this became more marked in the second half, when Shrewton scored three goals against one by the Balloons.

Jan. 18th.—St. Martin's v. Balloon School. At Salisbury, in heavy rain, this game had to be abandoned after 60 minutes' play.

### Uxbridge.

HOCKEY.—At Uxbridge, March 1st, the Royal Navy beat the R.A.F. by 4 goals to nil.

The weather was all against good play. The Navy were superior all round, and their scoring would have been much heavier but for the fine goalkeeping of AC. Buchanan, R.A.F.

SOCCER.—Middlesex Senior Cup. The R.A.F. Depot met Uxbridge Town in a replay in this League, a protest by Uxbridge having been upheld. Uxbridge scored a goal in the first three minutes. This seemed to have an inspiring effect on the Depot, who speedily equalised from a melee in front of their opponents' goal. The Depot controlled the rest of the game, the result being 5-1 in their favour.

Buildup Cup Competition: On March 8th the R.A.F. Depot beat the 1st Batt. Scots Guards by 5 goals to nil. This game was noticeable for clean play. In the first half the Depot bombarded the Guards' goal without scoring. The Air Force were the lighter team and proved too fast and accurate for the Guardsmen. F/Lt. Pakenham-Walsh scored 3 goals in less than 15 minutes.

### 18 Squadron Reunion Dinner.

It is proposed to hold a reunion dinner for all ranks of 18 Squadron. Former members of the Squadron who are interested are asked to communicate with J. Fuller, 10, Burlington Road, Bayswater, W.

### 46 Squadron Annual Dinner.

The above reunion will take place at Simpson's Restaurant, Strand, on April 1st, at 6 p.m.

Tickets, one guinea, inclusive.

It is earnestly hoped that all old members will do their

(Continued on page 233.)

# AERONAUTICAL ENGINEERING

SUPPLEMENT TO "THE AEROPLANE"

INCORPORATING AIRCRAFT ENGINEERING, AERODYNAMICS, AIRCRAFT FINANCE AND COMMERCIAL AERONAUTICS AND MATTERS PERTAINING TO THE AERONAUTICAL ENGINEER AND THE AIRCRAFT TRADER.

## THE WEEKLY COMMENTARY.

There is reported below a lecture on Seaplane Design which was given by Mr. W. O. Manning before the Institution of Aeronautical Engineers at a recent meeting. This paper deserves attention because the many practical problems which are continuously encountered in seaplane design are little known outside the restricted circle of those who build and use seaplanes.

This ignorance requires to be removed because seaplanes—at present in a comparatively primitive stage of development—have very great prospective uses in many fields where land machines are useless, and because the

well-meant efforts of certain land machine designers to produce seaplanes in the past have on occasion lead to a prejudice against seaplanes, merely because those designers failed to recognise some or all of the particular problems involved.

In this issue will be found an illustrated description of some of the many features of interest to be found in the detail design of the new De Havilland passenger-carrier, the D.H.34.

## THE DESIGN OF SEAPLANES.

The first of the meetings of the 1922 session of the Institution of Aeronautical Engineers was held on the evening of March 22nd, at the Engineers' Club, Coventry Street, at 8.0 p.m. The occasion was a lecture by Mr. W. O. Manning on "Seaplane Design."

After remarking that seaplanes were of two main classes, the float seaplane, which was frequently only a land machine fitted with floats, and the flying-boat, the lecturer proceeded to discuss those special features of the design of seaplanes which are not met in the case of land machines.

### HULL PROBLEMS.

Taking first the hull, attention was drawn to two schools of hull design—that which aimed at producing a rigid hull, and those who deliberately aimed at flexibility. The rigid hull was often built on similar lines to an aeroplane fuselage with struts and wire bracing. The flexible type of hull was originally due to the late Major Linton Hope, and its structure was based on light racing yacht practice. There was little doubt that the flexible type was the superior in practice, and this belief was confirmed by later designs of the rigid type, which incorporated features making for flexibility.

In early hulls a curious form of instability, known as "porpoising," was a common source of trouble. Tests made by Mr. Baker in the tank at the N.P.L. showed that a suitable arrangement of two steps and of the C.G. of the machine would overcome this trouble. The rear step acted much as the tail of an aeroplane, but the attainment of stability was scarcely calculable.

It was essential that all hulls should be fitted with watertight compartments, double bottoms or some equivalent protection in case of accidental puncture of the outer skin. Bulkheads presented serious difficulties, specially in a flexible hull. They must also be flexible, otherwise they destroy this quality in the hull, and they must be strong enough to resist the shock of water entering at high speed. So far no satisfactory bulkhead is available.

### LANDING LOADS.

Very little is known about loads on a hull bottom when alighting. Certain tests made on a rigid hull bottom indicated maximum pressures certainly not less than 8.2 lbs. per sq. in. in the vicinity of the keel, and that high local pressures are sometimes developed on the edge of the chine near the step. No such information is available as to flexible bottoms, but it is hoped that they will be available in the near future.

A mathematical investigation indicated that for similar hulls the landing shock would vary as the sixth root of the weight, and as the cube root of the length. From this it follows that for the same rate of acceleration the landing speed may increase with size, and if 50 knots is a safe landing speed for a 5,000 lb. boat, the safe speed rises to 56 knots for a 10,000 lb. machine and to 67 knots for a 30,000 lb. machine. Therefore the bigger the boat the higher the allowable wing loading, a fact which encouraged the building of large boats.

The question of the stresses in a structure such as a flexible

hull was very complex, and had apparently never been dealt with mathematically. But it was obvious that if local portions of greatly increased rigidity were introduced high local stresses might be set up. Therefore the problem of connecting a rigid wing structure to a flexible hull in such a way that the combination was sufficiently rigid for use as an aeroplane, yet still allowed the hull to flex locally, was a difficult one. No satisfactory solution was yet discovered.

Flying-boats of the future must be designed to be moored out for long periods. The present practice of loading them on to a trolley and putting them in sheds after every flight was intolerable. Serious damage to hulls was frequently caused by the trolley, and with large boats the practice would be impossible.

Wing-tip floats deserved some attention. They are necessary because the usual boat cannot be laterally stable on the water. They should be of flexible construction, fitted with at least two watertight compartments, and care was needed to secure that they would not in any case tend to drag under water if they were accidentally submerged.

### THE AERIAL STRUCTURE.

The aerial structure of the seaplane had to differ in some ways from that of the aeroplane. Strut fittings which did not need holes in the fabric were necessary, as water would enter such holes. The trailing edge presented a special difficulty. Some water always got into the wings, and a steel tube edge rusted and rotted the fabric. Wood became soaked and buckled badly. Hemp cord about three-eighths in. diameter was free from both difficulties and was very light.

Interplane and other exposed struts should be of steel tube. However careful one was with the selection and matching of timber, a certain number of wooden struts were always scrapped owing to warping. Such struts on a seaplane might be moored out all night in rain and subject to hot sun on one side in the morning. This invited warping. Steel was free from this trouble.

Generally ailerons could only be fitted to the upper plane, as such surfaces on the lower wing were apt to be damaged by water and to be fouled by handling ropes, etc. Careful design was needed to give adequate control with top ailerons only, and an extended upper plane was advantageous.

### CORROSION.

Great care was necessary to avoid materials liable to corrosion. Aluminium and its alloys needed to be used with great caution, particularly in contact with other metals. The best material for screws in aluminium appeared to be tin-coated steel, but even these should be fitted with varnished paper washers to reduce the contact area to a minimum. It was also unwise to have steel and copper alloys in contact, as this led to corrosion. Control cables would last longer on steel pulleys than on brass ones.

The question of corrosion was a very serious one, and the lecturer hoped to see the day when it would be possible to construct the whole flying-boat entirely of stainless steel and so get away from corrosion altogether.



Aircrews required to be at a height giving adequate water clearance and required brass tipping. Engines seemed to run quite well enveloped in salt spray, but it is desirable to fit watertight bags over magnetos and to fit a watertight canvas cover over the whole engine when moored out.

Tail and fins follow usual practice, except that they must be raised well above the water. The monoplane tail was preferable as it allowed greater clearance, but for very large machines the biplane type was inevitable.

Large size is an undoubted advantage to flying-boats, because the important quality of seaworthiness was almost automatically increased with size.

Finally Mr. Manning said that he would like to see an attempt to run a service such as the London-Paris with seaplanes. The Thames and the Seine were available as terminals, and there were several patches of water on the way which would serve as emergency landing grounds. In any case he would much prefer to be in a flying-boat forced to land in a field than in an aeroplane forced to land in mid-Channel.

#### THE DISCUSSION.

Mr. S. T. G. ANDREWS (Chairman), opening the discussion, said that the seaplane had received so little attention that it was very gratifying to have attention drawn to its special problems. The seaplane and the amphibian had many points in common, and the amphibian, if only from the point of view of safety, was of great importance. He was surprised to hear that the flexible hull was better than the rigid. Was there any evidence that the flexible type stood mooring out as well as the rigid type?

S/Ldr. HUME said experience showed it was possible to reduce the structure weight percentage of flexible hulls as the size of boat increased. Rigid types grew heavier. Flexible hulls acted as shock absorbers on landing, and hulls of that type had stood mooring out in very great gales, when dinghies also moored out had been lost.

Seaplane design had suffered in the past from two troubles. Firstly it had been assumed that anybody could design a seaplane, and secondly the over-sanguine claims of certain enthusiasts had been harmful. There were actually a whole set of new problems involved foreign to those of land machines, and there were limitations to the capacity of seaplanes. One could not build a single-seat fighter flying-boat comparable to the similar type of land machine, and it was no use pretending that one could.

The lecturer's classification of float machines under the heading of land machines on floats was unsound. Land machines on floats were of little use, and float seaplanes required to be designed as such.

In practice more damage was inflicted on seaplanes while they were on land than under flying or floating conditions. He hoped in time to see not only mooring out, but a docking system with flooded sheds so that for overhauls one simply floated machines into the shed, and if work on hulls was necessary close the shed lock-gates and pump the shed dry.

He agreed that wing-tip floats needed attention. Attention was needed to abolish them, for they were a nuisance to everybody.

Corrosion was a very serious matter indeed. Stainless steel unfortunately could not be worked in forms needed at present, but he hoped it would come. The corrosion of aluminium alloys depended not only on the composition but also on the working and heat treatment of the alloy. A specimen properly worked and treated might resist corrosion very satisfactorily. Another piece of the same alloy would fall to pieces in a short time, and it was impossible to rely on the qualities of a given alloy.

Flying-boats also offered special problems to the pilot. In one respect they all seemed to be alike, and that was that none of them was under directional control comparable to that of a normal machine. They all seemed to want bigger fins.

Capt. NICHOLSON welcomed this paper on a subject which had been much neglected. The aeroplane designer did not know enough about naval architecture, and the naval architect did not know enough about aircraft to produce a satisfactory seaplane. Both needed to co-operate. He wanted to stress the importance of the watertight bulkhead question. There ought to be bulkhead rules for passenger seaplanes, to secure reasonable safety if the boat were holed. Mr. Manning's pressure line diagrams on the bottom of a boat were somewhat similar to some he had obtained in 1912 on a racing launch. The ideal seaplane was a seaworthy boat which could fly. Americans had designed boats with short hulls and tail booms, but he did not think the type was good from a sea-keeping point of view. All sea experience showed that flexible hulls were much better than rigid hulls for light craft, and seaplane experience confirmed this.

Capt. SAYERS welcomed the paper as drawing attention to a subject which had been unduly neglected. Early in the War it seemed likely that under the aegis of the Admiralty seaplane design would advance rapidly. For a short time it

did so, and five years ago seaplane designers had successfully adopted some of the methods for increasing efficiency which were only to-day coming into use for land machines. Particularly there was a time when the possibility of using very heavily loaded wing surfaces was explored with extremely valuable results, but for some reason this development was dropped suddenly. The only explanation he had been able to find lay in the belief expressed by a distinguished flying officer, that any machine loaded to 10 lbs. per sq. ft. must inevitably break in the air.

Mr. Manning had drawn attention to the subject of corrosion and to the fact that certain metals could not safely be put in contact one with another. This did not apply merely to certain special metals; it applied generally that any two different metals in contact would corrode more rapidly than if they were isolated. It even went further, for evidence existed that corrosion would occur in an isolated alloy if that alloy were not homogeneous throughout. This was why heat treatment varied the resistance of aluminium alloys and of stainless steel, and the facts indicated that until the whole structure could be built of one single homogeneous metal corrosion must be expected.

S/Ldr. M. E. A. WRIGHT, as a pilot of wide experience with seaplanes of all types, said that there was no flying-boat seaplane which handled as well as a float-type seaplane. No boat handled as well engine off as it did engine on, and the stability was usually inferior on the glide. One possible reason was the use of short hulls and large tails in flying-boats, which was dictated by the desire to keep hull weight down. Seaplanes varied greatly in their stability and controllability on the water. One flying-boat designed by Mr. Manning was ideal in this respect. It could be taken off the water to 300 ft. with the use of no control except the throttle. Other types, particularly some with flat-bottomed hulls, if left to themselves, jumped off the water below a safe flying speed and stalled.

The flexible Linton-Hope hull was so effective as a shock-absorber that it was sometimes impossible to feel contact with the water. As the athwartship bulkhead presented so many difficulties he suggested that longitudinal bulkheads might be used.

Both boat and float type seaplanes had their advantages, and he would suggest that the possibility of a compromise, or "float" type might repay investigation. By this he meant a machine with a central hull and a fuselage above. The boat handled so badly that it was essential that some method be devised to overcome the trouble, and the "float" seemed to offer a solution. A trouble peculiar to amphibian machines was that the present type of tyre would not stand up to salt water. The life of a tyre on an amphibian was less than a month, and this difficulty was serious, for a burst tyre at landing might lead to serious accident.

Mr. S. EVANS said that in his view the seaplane had an immense commercial future, and that its development was of great importance. Mr. Manning had not referred to the monoplane type, and it seemed to him that the thick winged parasol monoplane offered many advantages for flying boats. Combined with the "Dorrier" arrangement of rudimentary wings acting as lateral water stabilisers the type seemed to solve many of the problems of the flying-boat. It had always struck him that the uncowed engines of seaplanes represented a retrograde step in practice.

Mr. MANXING, in reply, dealt with a number of queries addressed by various speakers. Stainless steel was only stainless when hard. For many seaplane purposes this meant that it would have to be worked first and then the component heat-treated as a whole. Some items, e.g., tanks, would be impossible, others very difficult to heat in this manner, but he hoped this difficulty would be overcome. He agreed with everything said as to the importance of bulkheads, but doubted if S/Ldr. Wright's longitudinal suggestion was possible.

It was true that the flying-boat did not handle as well as the float type, and this was almost certainly due to the wide divergence between C.G. and line of thrust. This divergence decreased as the size increased, and the bigger the boat the better it should be relatively. It had to be remembered that the seaplane had passed through very many fever stages in development than had the land machine, and this would account for some of the deficiencies.

#### THE INSTITUTION OF AERONAUTICAL ENGINEERS.

A party of twenty members with their friends visited the works of the De Havilland Aircraft Co., Ltd., at Stag Lane Aerodrome, Edgware, on Wednesday, March 22nd. By the courtesy of the Company, Mr. C. C. Walker showed the members all the details of the numerous machines which were in the course of construction.

They were especially interested in the new monoplane which is putting up such an excellent performance in weight carried per horse-power.





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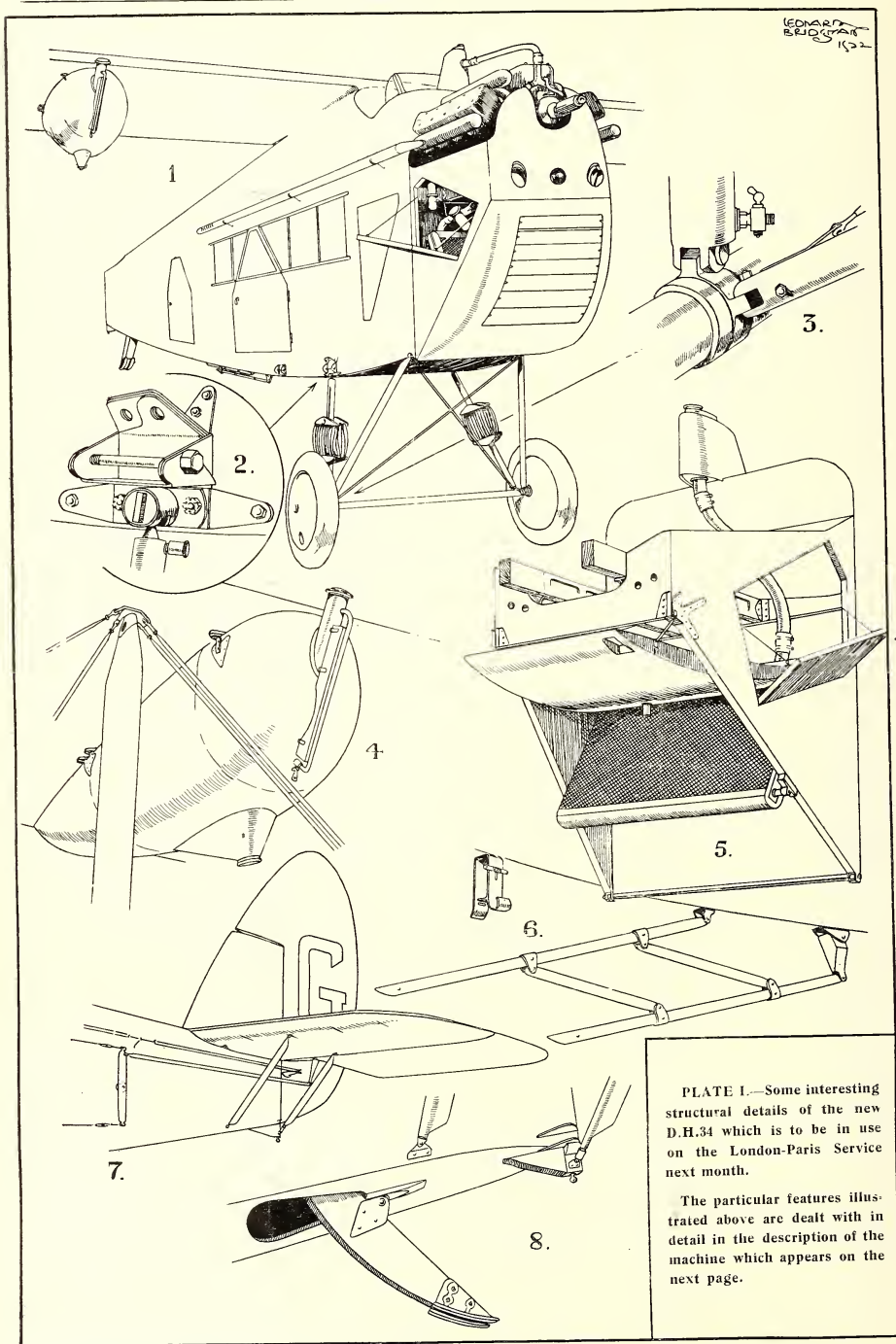


PLATE I.—Some interesting structural details of the new D.H.34 which is to be in use on the London-Paris Service next month.

The particular features illustrated above are dealt with in detail in the description of the machine which appears on the next page.

## AN APPRECIATION OF THE DH9c.

The following is an extract from a letter recently received from the Compañía Española de Tráfico Aereo—the Spanish aerial transport company which is running the Seville-Larache Air Line:—

“On the occasion of the completion of the first three months during which we have been operating the first Spanish air service between Sevilla and Larache, we should like to take the opportunity to place on record our satisfaction with the material and personnel provided by you. Using these exclusively, you will be pleased to hear that we have, since the inauguration of our service on October 15th, 1921, till January 15th, 1922, successfully completed 85 return journeys. This represents 42,500 kilometres covered without difficulty or mishap and an incalculable saving in time and increase in regularity over the existing means of transport.”

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## THE D.H.34.

The new 10-seater passenger machine known as the D.H.34, which is to be used on certain of the London-Paris lines during the coming Summer, was described generally in THE AEROPLANE of Dec. 21st last. The first of this new type is now very nearly complete, and it is possible to supplement that description by some account of the many details of interest which are to be found in the machine.

It will be remembered that this machine is based upon experience with the D.H.18, and that it greatly resembles that machine in general arrangement. The most striking alteration of arrangement is that the pilot's cockpit has been removed from behind the cabin to just ahead of it, nearly in line with the leading edge of the wing. Like the 18 the 34 is a Napier-engined tractor passenger carrier, but the 34 carries 9 passengers and pilot instead of the 7 passengers of the 18.

Referring to the illustrations here given, 1 (Plate I) shows the external form of the fuselage with the upper wing in place. It will be noted that there are three side entrance doors. The after door admits to the baggage compartment, the central one to the passenger cabin, and the forward door serves the pilot's cockpit. Suspended beneath the upper wing is one of the two main petrol tanks with gauge. The petrol system is purely of the gravity type, which is obviously the simplest and safest form of fuel supply, and the carriage of tanks in this position allows that system to be used, as well as removing all petrol from the vicinity of the cabin.

At the bottom of the cabin may be seen the wing spar attachments, and just behind the rear spar fitting there can be seen an appendage whose purpose is not at once apparent. It is actually a folding ladder for the use of passengers, and this detail will be referred to later.

The undercarriage is extremely like that of the D.H.18. It is of the steel tube Vee type. The front leg of the Vee is universally jointed to the lower corner of the fuselage just under the engine bulkhead. The rear leg is attached also by a universal joint under the front lower spar fitting. This rear leg is telescopic, and is sprung by the arrangement of rubber chord shown, which is in principle similar to the well-known "Avro" shock absorber. In addition this telescopic leg incorporates an internal oleo-pneumatic shock absorber. Details of this undercarriage are shown by Figs. 2 and 3.

Fig. 2 shows the fuselage fitting for the front lower spar, for lift wires and for the rear undercarriage leg. This shows clearly the ball joint attachment of the undercarriage, and one feature indicative of the thought expended on detail in this machine, the grease-cup which provides lubrication for the internal sliding surfaces of the telescopic strut. Fig. 3 shows the joint at the axle tube of this undercarriage. The axle is of the fixed type, and the simple and easily dismountable nature of the joints should be noted. The cock on the rear tube is for the release of oil from the oleo gear.

The general form of the nose of the machine is also shown. Note the open door at the side. This not only serves for access to the oil tank filler cup, which may be seen, and to other parts of the engine installation, but may be used as a step when access to the upper parts of that installation may be necessary. Details of this nose will be considered later.

The long exhaust pipe, closed at its far end, and fitted with numerous narrow slots, should prove to be an effective silencer, which does not entail any greater weight or resist-

ance than would be needed merely to carry the exhaust past the cabin.

Fig. 4 shows one petrol tank, with filler and gauge, and one of the interplane strut terminals on the upper wing. The simplicity and straightforward nature of these details should be remarked, but call for no further comment.

Fig. 5 shows the framework of the nose of the machine. This is a unit attached to the cabin in front of the fire and sound proof bulkhead by one bolt at each of its four corners. It carries engine bearers, radiator, oil tank and the cowl, and the whole unit with engine may be removed bodily and replaced by another unit after undoing these four bolts, and a small number of petrol, water, and control connections. This framing consists of a pair of timber and three-ply sides, roughly triangular in side elevation, tied together at their front end by a multi-ply bulkhead. The engine bearers are roughly level with the top edge of this front bulkhead, and beneath the bearers there is an aluminium tray which serves to collect any oil or other drippings from the engine. This tray is fitted with a drain-plug. The oil tank is above the tray and invisible in the sketch; but its position is indicated by the filler cap, shown through the open door in Fig. 1. (In Fig. 1 the tray is not in position.)

The radiator is slung in an inclined position below this drip tray. Air reaches it through the shutters (shown in the front cowl in Fig. 1). The cowl on the under side of the nose does not reach right back to the fireproof bulkhead, and the space so left allows for exit of air entering through the shutters. The sketch shows clearly the connection from the water header tank to the radiator; the other connection from header tank to engine jackets is shown in Fig. 1.

Fig. 6 shows the collapsible ladder for the passengers already noted.

From Fig. 7 it will be seen that the tail unit is of the familiar type standard in this make of machine. The arrangement whereby the elevator control cables are coupled to a single push-and-pull rod to control the elevator and the special fairlead used by this firm is shown on the rudder control. This fairlead consists of a solid steel rod running in a solid bush, cables being attached to each end of the rod. In accordance with standard De Havilland practice there are no pulleys in any control cable circuit. Wherever it is necessary to change the direction of a control lead, a system of bell cranks is used. Also no cables pass through fairleads; all fairleads are of the type described.

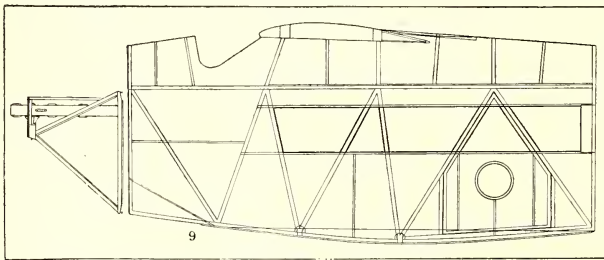
Fig. 8 shows the form of tail skid used. The steel shoes fitted are of ample surface, and easily replaceable. At the extremity of the fuselage there will be noticed a projecting wedge furnished with a steel knob. This should serve to protect the tail plane stays in case of failure of the tail skid, and also allow supporting the tail for removal of or repairs to that skid.

Fig. 9 shows closely to scale the structure of the engine nose and of the cabin structure. These parts of the machine are, except for fittings at joints, built up with timber struts and covered with plywood. This remark applies to the whole fuselage, which is therefore free from all wire bracing and from the troubles attendant on the stretching of that material.

The general specification of the machine and scale drawings thereof were given in the description already mentioned. The former item is, however, repeated here:—

## SPECIFICATION OF THE D.H.34.

Span .....	59 ft. 6 in.
Length .....	39 ft.
Height .....	12 ft.
Chord .....	6 ft. 3 in.
Total area .....	590 sq. ft.
Weight, empty .....	3,365 lbs.
Weight, fully loaded .....	6,218 lbs.
Useful load .....	1,900/2,000 lbs.
Engine .....	Napier, 450 h.p.
Wing loading .....	10.5 lbs. per sq. ft.
Weight per h.p. ....	13.8 lbs.
Cruising speed .....	105 m.p.h.
Fuel capacity .....	3½ hrs.



## THE BRISTOL GAS STARTER.

The Bristol Aeroplane Co. Ltd., of Filton House, Bristol, have just published an excellently illustrated and clearly worded booklet describing the very ingenious "Gas Starter" which they have developed for aircraft and other engines. Those who desire somewhat fuller details of this appliance than it has been possible to give in this paper should apply to the firm for a copy of the booklet.

## THE ROYAL AERONAUTICAL SOCIETY.

STUDENTS' SECTION.—Programme of Students' discussion

meetings in Library of the Society, 7, Albemarle Street, W.1, at 6.45 p.m.:—

April 7th.—"Annual Lecture" before Students' Section.  
"Some Outstanding Problems in Aeronautics," by Professor Leonard Bairstow, F.R.S.

## RECEIVERSHIP.

SUSSEX AERO CLUB LTD.—H. Wingfield, of 67, Watling Street, R.C., ceased to act as receiver or manager on March 9th, 1922.

(Continued from page 226.)

ntmost to be present, and those intending to do so are requested to communicate at once with and send cheque to C. J. Marchant, 10, Bush Lane, Cannon Street, E.C.4. Dinner jackets.

#### 47 Squadron Reunion Dinner.

The reunion dinner of 47 Squadron (Salonika), due to take place in April, will not be held. It is proposed to hold this reunion later in the year, possibly on the date of the R.A.F. Aerial Pageant. A further notice will be issued in due course. Communications should be sent to Capt. D. F. Woodford, Selfnurst Park, Chichester.

### UNDER THE SEARCHLIGHT.

UNDER THE SEARCHLIGHT. By Violet Douglas-Pennant (George Allen Unwin Ltd. 493 pp., 4 illus. 12s. 6d. net.)

This book should never have been written. Its sole object is to ventilate a personal grievance, and to do so the author reopens an almost forgotten scandal and cast a further slur on the name of a very fine Force. The question of whether she was fairly treated or not was decided by a Committee of the House of Lords and no possible good can be attained by publishing one side of the case in the form of a book.

Miss Douglas-Pennant has been at great pains to assure her readers that she had nothing but the welfare of the W.R.A.F. at heart, and yet from the day she left the Force she has waged against it a campaign of concentrated slander.

Her unsuitability for the job of running the W.R.A.F. is summed up in an extract from the book under review. She had been down to settle a strike of women in a big camp and she says: "They . . . promised . . . never to strike without first discussing the matter with me." This sort of thing may have been the right attitude to adopt towards the Girls' Friendly Society, of which she was a leading light, but it was hardly the way to handle a case of insubordination among troops.

She complains bitterly of the mass of detail with which she had to contend and yet there was no apparent reason why this work should not have been decentralised. Having accepted the resignations of the five unsuitable candidates for important appointments, she gathered together a keen and enthusiastic staff at the Air Ministry. This staff, composed of junior officers specially selected from the training course, were allotted work suitable for unskilled clerks and were treated with consistent rudeness by a civilian male clerk of military age who was Miss Douglas-Pennant's chief assistant.

Miss Douglas-Pennant may have been an excellent civil servant but she had absolutely no knowledge of precedent or discipline. In the course of her opening lecture to the probationary officers on July 6th, 1918, she told them that above all they must be loyal to the Service, and yet while a number of those officers were still serving, their late Commandant was making a violent and irresponsible attack on that same Service. When one contemplates the work done by the women of the W.R.A.F. and then reads "Under the Searchlight," one can only be devoutly thankful for two things. Firstly that Miss Douglas-Pennant left the W.R.A.F. in time to let it become what it became before the end of the War, and secondly that however much mud is thrown at the W.R.A.F. it won't stick because you can't reckon without the R.A.F. who were there and know.

Miss Douglas-Pennant's work at the Air Ministry was seriously handicapped. Let that be said in her defence. The administration of the W.R.A.F. in its infancy has been compared with the early administration of the O.M.A.A.C. This is not a fair comparison. The O.M.A.A.C. had to deal with the Regular Army, Regular Army methods, Regular Army organisation, and above all, the Regular Army officer. The infant W.R.A.F. had none of these advantages.

Finally if there had been a little more searchlight on the work of the W.R.A.F. and a little less on Miss Douglas-Pennant one would have read the book with considerably more pleasure.—C. M. McA.

### AN OPPORTUNITY IN LATVIA.

The Latvian Government are proposing to establish a series of air communications and it is contemplated to open up services between Riga-Memel, Riga-Reval and Riga-Kovno, and later on Riga-Moscow.

British firms and other interested parties are invited to communicate with the General Post and Telegraph office, Ministry of Communications, Riga, submitting to the latter the terms under which they would be prepared to undertake the establishment of the said services. It may be added that the Latvian Government will not subsidise the enterprise.

### A YEAR OF SUBSIDISATION.

On Tuesday, March 28th, the Handley Page Transport Ltd. and the Instone Air Line in concert provided a lunch at the Hotel Cecil to commemorate the completion of the first year of successful civil aviation operations under the British Subsidy scheme. Lord Gorrell, C.B.E., M.C., Under Secretary of State for Air, was in the Chair and was supported by many prominent representatives of both the Air Ministry and the Aircraft Industry. Upon the conclusion of the serious business of luncheon there was as is usual some considerable speech making. Unfortunately owing to the indiscretion of the hosts in fixing the luncheon for the day whereon this journal goes to press, it is not possible to give more than a very condensed account of this part of the proceedings.

Lord Gorrell, proposing the toast of the British Aircraft Industry, said that the result of the past year's work could not be ignored. There was the incident of the lady who on arrival at Le Bourget tipped the pilot sixpence. There was also the lady who hired the aeroplane to take her to Harrogate and on arrival said "Wait." These incidents pointed to the dawn of a sense of the ordinariness of flying and that was a certain omen of the eventual success of civil aviation. During the past year British lines had carried 20 per cent. more passengers with 50 per cent. fewer machines on the London-Paris service than the French lines. Goods were less satisfactory, but the future held hope. The Air Ministry was doing everything it could to help civil aviation, but it was not usually realised how seriously it was handicapped. The recent pronouncement in Parliament secured the continued existence of the Ministry and their chief fight might be regarded as won. He hoped that next year's traffic figures would show continued growth of this service.

Mr. HANDLEY PAGE said that he could speak with mingled satisfaction and disappointment of the past year. The satisfaction lay in the high standard of reliability and safety attained. Six months' running cost only £150 for breakages. Disappointment lay in the small extent of development. Drake was the first man to circumnavigate the world, and from his pioneer work grew our mercantile marine. British pilots and British machines had made all the pioneer long distance flights—and from that work had grown a London-Paris service. He would plead and urge that the time had come to throw open to commercial enterprise the development of Imperial long distance routes. No development work could be of avail if the public interest was not stirred, and he urged propaganda among the young, on the ground that the boys of to-day pay the taxes of to-morrow. The best method of educating the public was to let them see flying, and he wanted internal air services in England. There could be no better advertisement for civil aviation than a London to Glasgow Air Service—especially if they could get Scotsmen to use it.

Sir SAMUEL INSTONE thought civil aviation had not done so badly under the circumstances. The public of all nations had shown that they preferred British to foreign machines. The Air Ministry was businesslike, courteous and anxious to help, but had not enough resources. The excellent Air Ministry Meteorological service was very largely responsible for British reliability. There would be three air lines working from this side in the next year, and he felt sure they would work together as amicably as the present two had in the past. They did not know what the future had in store, but they were well of confidence.

Maj.-Gen. Sir FREDERICK SYKES expressed the strenuous desire of his Department to do all they could, but pleaded the limits of their resources. The Channel service was only a demonstration and extensions must come. Something could be done both in England and on the Continent, but the goal of endeavour must be the Imperial routes.

Mr. BALDWIN RAPEL, M.P., said that as Secretary of the Parliamentary Air Committee he had to acknowledge the growing help of the Press in rousing interest in Aviation—and so securing attention in Parliament.

The proceedings terminated by a vote of thanks to Lord Gorrell, moved by Sir Samuel Instone and seconded by Sir James Stevenson.

### BRIGHTER MONTE CARLO.

C. G. Grev, Editor of THE AEROPLANE, is now in France on a short holiday. Contrary to the practice so much in vogue these days among visitors to the Mediterranean he has omitted to take with him the bank balance of THE AEROPLANE, neither has he travelled by Air Express.

Furthermore he will return to England in a week or so quite voluntarily, the only official escort being "Herself."—C. D.



# COMMERCIAL AERONAUTICS

## AND CIVIL AERIAL TRANSPORT.



### THE UNITED KINGDOM OF GREAT BRITAIN AND IRELAND.

#### CONTINENTAL ARRIVALS AND DEPARTURES.

[The following table of arrivals at and departures from the British Air Ports is compiled on the following system:—First comes the initials of the Air Line; next the type of machine; next the international number of the machine; next the ports of departure and destination; next the times of departure and arrival; next the cargo, whether goods (G) and/or mails (M); next the number of passengers; and finally the name of the pilot and number of mechanics, if any.]

ABBREVIATIONS:—A.D.—Aircraft Disposal Co. F.A.—Flemish Aviation Co. B.C.—Bristol Aeroplane Co. B.M.—Bromport House Co. C.A.—Department of Civil Aviation. D.H.—De Havilland Aircraft Co. G.E.—Compagnie des Grands Express Aériens. H.P.—Handley Page Transport Ltd. I.L.—Instone Air Line K.L.—Koninklijke Luchtvaart Maatschappij. L.A.—Leatherhead Aviation Services. M.A.—Messageries Aériennes. M.W.—Marconi Wireless Telegraph Co. Ltd. P.O.—Privately owned. P.L.—Peters Ltd. S.F.—Surrey Flying Services. S.N.—Syndicat National pour l'Etude des Transports Aériens (S.N.E.T.A.).

The London Terminal Aerodrome, Croydon. (Telephone: Croydon 2720.)

#### MARCH 20th:

G.E., Goliath, F-ADDT, London-Paris, 11.50-14.20, G., Nil, Favreux & I. M.A., Breguet, F-CMKA, London-Paris, 12.00-14.27, G., Nil, Delage. H.P., HP, G-EATH, London-Paris, 12.17-14.30, G.M., 2, Wilcoxon & I. M.A., Spad, F-ADAC, London-Paris, 12.33-14.56, Nil, Nil, Briere. I.L., DH8, G-EAWO, London-Paris, 12.35-14.53, G.M., 3, Robins. G.E., Goliath, F-GEAC, Paris-London, 12.39-14.09, G., 5, Gastoux & I. I.L., DH8, G-EAWW, Paris-London, 11.55-14.55, G., 6, Courtney. H.P., Bristol, G-EAWY, Paris-London, 12.00-15.27, G., 7, Rogers & I. M.A., Breguet, F-ADIM, Paris-London, 13.05-16.35, G.M., Nil, Robyn.

#### MARCH 21st:

I.L., DH8, G-EAWW, London-Paris, 12.16-16.00, G.M., 3, Holmes. M.A., Spad, F-ADBI, London-Paris, 12.17-15.50, G., Nil, Le Sec. H.A., DH4, G-EAWH, London-Paris, 12.25-14.50, Nil, 2, Rogers & I. H.P., Bristol, G-EAWY, London-Paris, 12.29-15.00, M., 6, McIntosh & I. G.E., Goliath, F-GEAO, London-Paris, 12.30-15.30, G., 2, Gastoux & I. I.L., DH8, G-EAWO, Paris-London, 12.00-14.28, G., 4, Robins. H.P., HP, G-EATH, Paris-London, 12.02-Hawking, G., 5, Wilcockson & I. M.A., Spad, F-ACMC, Paris-Ldn, 13.05-13.07/21st, G.M., 2, Portat. G.E., Goliath, F-GEAD, Paris-Ldn, 11.40-11.30/22nd, Nil, Nil, Chalcumb & I.

#### MARCH 22nd:

Nil.

#### MARCH 23rd:

M.A., Breguet, F-ADIM, London-Paris, 11.02-15.40, G., 1, Robyn. G.E., Goliath, F-GEAC, London-Paris, 14.10-17.05, G., Nil, Gastoux & I. I.L., DH8, G-EAWO, London-Paris, 14.10-16.35, G.M., 4, Robins. I.L., DH8, G-EAWO, London-Paris, 12.00-14.55, G., 4, Robins. G.E., Goliath, F-ADDT, Paris-London, 13.00-16.00, G., 2, Pierce & I. H.P., Bristol, G-EAWY, Paris-London, 13.10-16.17, G., 3, McIntosh & I. H.P., DH4, G-EAWH, Paris-London, 13.15-15.40, Nil, Nil, Rogers. M.A., Spad, F-ADIB, Paris-London, 13.30-16.35, G.M., 2, Perignon. H.P., HP, G-EATH, Paris-London, 14.10-17.48, Nil, Nil, Olley & I.

#### MARCH 24th:

G.E., Goliath, F-GEAD, London-Paris, 11.40-14.24, Nil, 6, Mire & I. H.P., Bristol, G-EAWY, London-Paris, 12.17-14.50, G.M., 5, Rogers & I. I.L., DH8, G-EAWW, London-Paris, 12.15-14.35, Nil, 2, Bradley. M.A., Spad, F-ACMC, London-Paris, 14.05-16.45, G., 1, Portat. G.E., Goliath, F-GEAO, Paris-London, 11.25-14.25, G., 5, Favreux & I. I.L., DH8, G-EAWO, Paris-London, 11.55-14.32, G., 2, Robins & I. M.A., Spad, F-ACMB, Paris-London, 14.38-17.15, G.M., 1, Briere. G.E., Goliath, F-ADAY, Paris-London, 15.00-17.47, Nil, 6, Le Sec & I.

#### The London Terminal Aerodrome.

##### THE AIRCRAFT DISPOSAL COMPANY.

Plenty of machines have been tested by Mr. Stocken this week and there has been a considerable amount of engine testing on the ground also. On Wednesday while Mr. Stocken was up on an Avro the wind increased enormously after he had taken off and on landing again he was very nearly blown over, as it was he went onto a wing tip once.

On another occasion he was taking off with Mr. "Jock" Anderson as passenger over the new Brighton Road when the engine petered out. He was not high enough to turn and there was no chance of getting down inside the fence so he just managed to hold her up until he passed over the iron fence and the two wooden fences bordering the road. He landed just about five yards short of some women, who were teasing turnips in the field, who just glanced up at the machine coming at them and went on working. As the engine was somewhat doubtful and the wind rather high, Mr. Stocken decided not to fly back, so he taxied through a gap in the fence onto the Brighton road. He then taxied down the road and entered the Disposal Company's premises by the side gate. Mr. Stocken claims the privilege of being the first driver of a private vehicle to use the new road.

The engine of the D.H.9 which was recently fitted with the Grant silencer was found to be some 25 revs. short when the silencer was removed, and so evidently the silencer has no effect on the efficiency of the engine. However, to make

#### MARCH 25th:

G.E., Goliath, F-ADDT, London-Paris, 11.45-14.10, G., 7, Favreux & I. M.A., Spad, F-ADBI, London-Paris, 12.27-14.56, Nil, 1, Perignon. M.A., Spad, F-ACMB, London-Paris, 12.29-15.08, G., Nil, Briere. H.P., Bristol, G-EAWY, London-Paris, 12.50-16.07, Nil, 7, McIntosh & I. I.L., DH8, G-EAWO, London-Paris, 13.17-15.40, M., 8, Robins. H.P., Bristol, Paris-Ldn, 08.11-11.28, Nil, 10, McIntosh & I. I.L., DH8, G-EAWW, Paris-London, 12.00-14.55, G., 6, Bradley. H.P., HP, G-EATH, Paris-London, 12.17-15.55, G., 1, Rogers & I. G.E., Goliath, F-ADCA, Paris-Ldn, 13.15-16.20/26th, G., 5, Charpentier & I.

#### MARCH 26th:

I.L., DH4, G-EAMU, London-Paris, 11.15-14.00, G., Nil, Bradley. I.L., Vimy, G-EAMI, London-Paris, 12.38-15.46, Nil, Nil, Barnard & I. I.L., DH8, G-EAWO, Paris-London, 13.20-16.00, Nil, 8, Robins.

#### Inland Flying at Croydon.

March 24th-23rd.—Nil.  
March 25th.—I.L., DH8, tests (Bradly); S.F., Avro, joy-rides (Muir); H.P., H.P. to Bristol (Olley & I.).  
March 25th.—S.F., joy-rides (Muir); I.L., Vimy, test (Barnard); H.P., D.H.8, tests (Slav and Olley).  
March 26th.—S.F., Avro, joyrides (Muir); R.A.C., Avro, joyrides (Draper).

#### Flying by the Aircraft Disposai Co.

March 26th.—Avro, Martinsyde F.4, tests (Stocken).  
March 21st.—Bristol Fighter, M-MRAK, test (Stocken).  
March 22nd.—Avro, Martinsyde F.4, tests (Stocken).  
March 23rd.—Martinsyde F.4, test (Stocken).  
D.H.9, G-EABD, left for Brussels (Piercy); Avro, G-EBCC, left for Brussels (Courtney); Avro, test (Stocken); Avro, test (Stocken); D.H.9, test (Stocken); D.H.9, test (Stocken).  
March 24th.—D.H.9, demonstration (Stocken); D.H.9 demonstration (Stocken); Avro, G-EBDC, test (Stocken).  
March 25th.—D.H.9, G-EBDE, test (Stocken); D.H.9, G-EBBE, left for Brussels (Piercy).

#### Cross-Channel Statistics.

Week ending March 26th:—  
Machines, 50; Passengers, 120; Crews, 84; Total Personnel, 213.  
Corresponding week last year:—  
Machines, 44; Passengers, 168; Crews, 62; Total Personnel, 230.

quite sure it is being fitted to another machine, when it will be possible to cut out the silencer altogether.

The A.D.C. are entering several machines for the Easter Monday races, one of which will be the A.D.C. "Dark Horse."

On Saturday Mr. Piercy went to Brussels on a D.H.9 for the Belgian Government.

#### GENERAL FLYING.

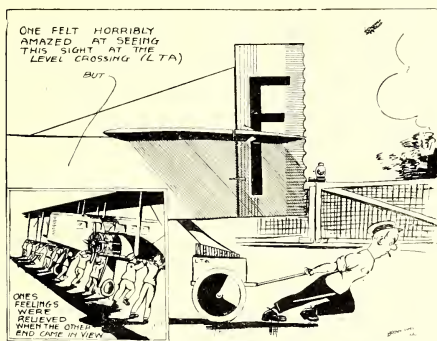
The air lines have suffered somewhat from the gales of the last week. On Tuesday nothing got through and on Wednesday a "Goliath" came in early from a forced landing at St. Ingelvert.

The sky was full of snow clouds and a few miles south of the aerodrome several inches of snow was reported on the ground. Mr. Robins, who was flying a D.H.8 for the Instone Air Line, came up against various snow storms, but managed to get through all right.

Mr. Bradley, now a regular Instone pilot, completed his tests on the D.H.8 during the week and took G-EAWW to Paris on Friday, returning on Saturday. He made an exceedingly good landing.

Mr. Olley brought the O/400 Handley Page fitted with the Bristol "Jupiter" engine back from Paris on Thursday and the following day took her back to Bristol, where the engine will be removed and examined after the tests. While in Paris the engines were much admired and many officials of the French Air Ministry had flights in the machine. The Bristol "Jupiter" engines are to be used by the French and





**THE TWO GOLIATHS.**—A scene at Croydon Aerodrome showing an apparently wonderful feat of strength and the explanation thereof.

will be built under licence by the Gnome and Le Rhône Company.

On Saturday the first machine to arrive was the Handley Page Bristol ten-seater which left Paris soon after 08.00 hrs. piloted by Mr. MacIntosh. The machine was quickly turned round and went back to Paris again with a full load. Mr. Rogers came in from Paris about 16.00 hrs. on an O/450.

The Instone Air Line first decided to send a D.H.18 that day but owing to plug trouble they then decided to send the "Vimy." This machine had just been overhauled, so before starting off Mr. Barnard took her for a test, in which he threw her about in great style. As he carried Major Blake as a passenger and as he never kept the "Vimy" on an even keel at all, it was thought that he had some connection with the "Anti-Wilfred League" of the *Daily Mirror*.

When he landed, he reported that the air speed indicator was on strike and as the weather promised to be fairly thick he decided not to send the machine. By this time the D.H.18 was ready, much to the joy of Mr. F. Hazell-Jones of Napier's, who was one of the passengers, so it was brought round and the passengers were embarked. Mr. Robins quickly started off and after a circuit it was seen that he was coming in to land. One of the onlookers declared that he could hear the engine missing, but as the cause of landing was merely to close one of the cabin skylights which was unfastened, it is thought that the onlooker has very keen hearing to be able to detect the banging of a skylight through the roar of a Napier "Lion." The machine started off again at once and made Paris in good time.

On Saturday afternoon Handley Page Transport had their new D.H.18, G-EAWX out on test. They very wisely obtained the services of Mr. Shaw, who is an experienced D.H.18 pilot, to make the initial tests. Mr. Olley then made his debut on the machine.

Mr. Muir was taking passengers busily in G-EAIR, and after that he had a member of the R.Ae.C. up doing dual on a Club Avro.

The D.H.34s will reach the aerodrome at the end of the week. The Daimler Hire demonstration, which should have taken place at Croydon on Wednesday, will be at Stag Lane instead.

The Daimler Airway has the only building on the aerodrome to boast of real fireplaces, the edifice being built round a

trick-chimney, and each of four offices has an excellent home-like-looking hearth, but that of Major Woods-Humphrey is twice as big as any other.

Handley Page Transport have secured the big brick hut right on the tarmac and so have the best position. Marconis are erecting a hut between this and the Daimler hut, and opposite to the Instone offices.

In the notes for next week one hopes to record the initial operations of the Daimler Airway.

#### CROSS-CHANNEL STATISTICS FOR 1921-22.

Since the air lines operated under the subsidy scheme from 1 March 21st, 1921, to March 21st this year 3,444 machines have passed between England and the Continent, carrying in all 16,422 people, of which 10,117 were paying passengers. Almost two thirds of these passengers were carried by British machines. No passenger was injured (the writer is using a wooden penholder); the only fatality occurred to the pilot of a Belgian-owned machine which broke in the air over the Channel.—G. D.

#### Brooklands.

There has been a fair amount of flying by Vickers machines here recently, and one saw a beautiful spiral by a "Viking" the other day. The engineering lock-out has not greatly affected the Vickers works.

Mr. R. K. Pierson is reported to be in Germany on a special mission for the firm.—J. F. S.

#### Stag Lane.

On Sunday the first D.H.34 was successfully tested. The machine was first flown by Capt. Geoffrey de Havilland, and afterwards by Mr. Alan Cobham. One understands that it was completely successful. Demonstrations with the machine will take place to-day, Wednesday, and the first machine should be at Croydon by the end of the week.

There are four machines for the Daimler Airway and two for the Instone Air Line.

On Friday Messrs. Alan Cobham and C. D. Barnard flew up to Aintree to fetch photographs and films of the Grand National. On their return they landed the cargo at Cricklewood; Mr. Barnard encountered very bad weather.

The following day Mr. Barnard flew to Burnley to bring back photographs of a "Soccer" Cup-tie match. He made a quick trip back, and although the match did not begin until 15.00 hrs. the photographs were in Bouverie Street before 18.15 hrs.

## PERSONAL NOTICES.

#### DEATHS.

**CAREY-THOMAS.**—On Friday, March 10th, 1922, killed in the air over Benoni, Transvaal, whilst in action against the Revolutionaries, Capt. William Warren Carey-Thomas, M.C., late R.A.F., Adjutant South African Air Force, son of the late Charles Carey-Thomas and Mrs. Carey-Thomas, of Penarth, Glam.

**SKET.**—On March 26th, at Shrublands House, Berkhamsted, May, the beloved wife of J. G. Sket, M.R.C.S., L.R.C.P.

#### ENGAGEMENT.

**HEWAT-FRASER.**—A marriage has been arranged, and will take place on June 7th, between S/Ldr. H. A. Hewat, R.A.F., M.S., younger son of the late E. G. Hewat and of Mrs. Hewat, 2, North Charlotte Street, Edinburgh, and Isobel Margaret, elder daughter of Lieut.-Col. J. W. Fraser, C.M.G., and Mrs. Fraser, of Lockninch, Garve, Ross-shire.

#### MARRIAGE.

**WOODHOUSE-RENNIE.**—On March 22nd, Capt. Reginald Woodhouse, late R.A.F., son of the late Henry Woodhouse, of Maidenhead, to Bertha (Bea) Rennie, daughter of the late Robert Blanchett Rennie and Mr. Blanchett Rennie, 3, Burton Court, Chelsea, and Westcliff-on-Sea.

#### BIRTHS.

**SKET.**—On March 17th, at Shrublands House, Berkhamsted, to May, the wife of J. G. Sket, M.R.C.S., L.R.C.P., a son.  
**WILDMAN-LUSHINGTON.**—On March 24th, at The Noads, Hythe, Southampton, to Kathleen, wife of Capt. G. E. Wildman-Lushington, R.M.A.—a daughter.

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 Vickers, Ltd., Vickers House, Broadway, London, S.W.1. "Vickers," Vic. London. Victoria 6900 ..... 225

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R.F.D. Company, 21, Queen's Road, Hersham, Surrey. Escher 365 ..... 236

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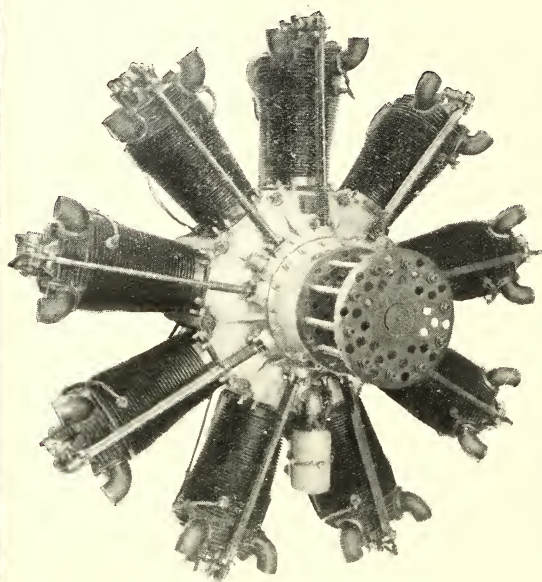


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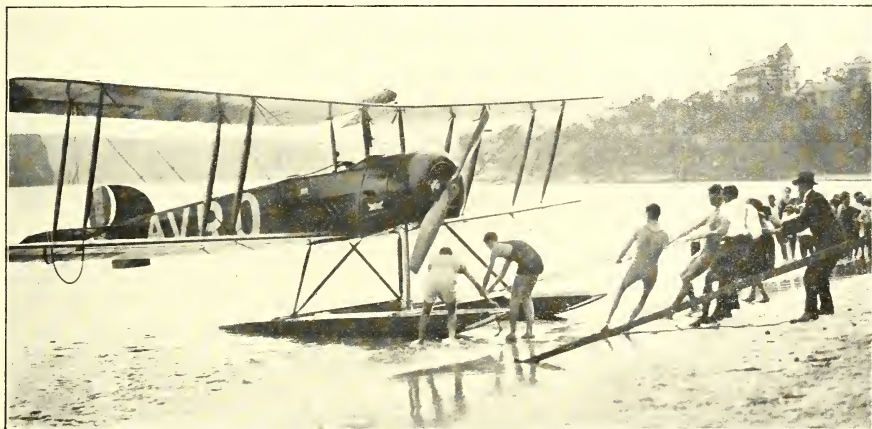
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## THE AIR DEBATE.

The debate on the Air Estimates took place on March 21st. Between 10.00 hrs. and 23.00 hrs. the Members engaged in the debate spoke many pages of *Hansard*, which is the equal of several issues of *THE AEROPLANE*. And even then they had not finished. It will therefore be understood why the debate is not reported verbatim.

The curious thing about the debate was that all the speeches were good. Even the anti-Air Force speeches delivered by the leaders of the campaign by the Navy and Army against the Air Ministry were good in manner though feeble in matter. Nothing was said which is of actual historical interest, or which is likely to alter the development of the R.A.F. At the same time one strongly recommends all those who are concerned with or for the R.A.F. to buy *Hansard* for March 21st (Vol. 152, No. 21, price one shilling net) from His Majesty's Stationery Office, Kingsway, W.C. and study the speeches, for they will find much in them that is conducive to thought and a good deal that is highly entertaining.

Captain GUEST reiterated Mr. Chamberlain's statements to the effect that the R.A.F. must be autonomous and would in future form our first line of defence. He gave some quite interesting details of the work which the R.A.F. is doing—most of which are familiar to readers of this paper.

He gave credit for the excellence of the buildings built at Cranwell during the War by the Admiralty, "who were famed for the excellence of the bricks and mortar which they provided during that period"—a delightful back-handed compliment—and told the House a great deal about the present and future work of training R.A.F. personnel. He explained why and where the R.A.F. disagreed from the Geddes Committee and put the onus of mounting the R.A.F. on "reconditioned" machines instead of new ones on the Chief of the Air Staff. But he also stated definitely that the R.A.F. would have to be re-equipped by 1924-25. He outlined the re-organisation of the Air Ministry by which the Director-General of Supply and Research will take over Equipment as well and so will sit on the Air Council definitely as a representative of the R.A.F.

He did his best to excuse the ineptitude of the Department of Civil Aviation and blamed it on "the difficult times in which we live." And he stated that it was the "definite policy of the Air Ministry to steadily develop" the Imperial chain of air routes from Europe to Australia.

He ended by a confession of faith in the R.A.F.—"a service of young and enthusiastic men, led and inspired by an incomparable chief," and said: "The air front (in the next war) may be joined before the army reservist has reached the nearest station or the battleship has got up steam"—which latter seems more than likely.

General SEELY paid the usual charming compliments, and then talked very sound sense. Particularly he wanted to know why the Secretary for War and the First Lord of the Admiralty are members of the Cabinet while the Secretary for Air is not. Which seems ridiculous now that the R.A.F. is officially the First Line of Defence.

He complained that we have only three Home Defence squadrons while France has 120 and is going to have 220. And he stated with authority that in 1921 France was producing 150 new machines per month for her Aviation Service.

Lieut.-Col. MOORE-BRAZOV in one of his wittiest speeches referred irreverently to the supporters of the Geddes Committee as "amateur economists." He laid stress on the refusal of the Navy and Army to co-operate with the R.A.F. by sending their own people to learn to fly. And he said that for 100 years the Navy had been "the spoilt darling of this nation" for one reason, and one reason only, and that was because it could defend us.

He said: "During the War the Navy showed that they practically could not look after our commerce on the seas without the assistance of air power. Is it logical to put a Service which cannot do a thing over a Service which can?" Which, as he said, was the proposition which Admiral Hall advanced.

He referred to Field-Marshal Sir Henry Wilson as "an ornamental and distinguished Member" and proceeded to flay him verbally for his foolish speech at Amiens. He called for an over-riding power, either a Ministry of Defence or a Committee of Imperial Defence, to keep the three Services in their proper places.

Sir WM. JOYNSON-HICKS exposed the folly of thinking that we are going to wage the next war without gas and pointed out that air bombs are four times as effective as shells. He made one great mistake in decrying expenditure on Staff colleges, officers' colleges and training schools, forgetting apparently that workmen must be trained before they can be put in charge of expensive tools. What we want is both machines and training establishments.

He very rightly drew attention to the absurdly small amounts allocated for new engines and asked "how much money it is desirable to transfer from the Navy and the Army to the Service which will gradually take the place of these two great Services."

Field-Marshal Sir HENRY WILSON used arguments of the type usually called "Jesuitical" to prove that the Independent Force, R.A.F., was not independent. If one did not know that he was a North of Ireland Orangeman one would suspect him of being a product of Clongowes Wood.

He argued in a futile way against giving an Air Officer command of Home Defence, and asked whether he would have power to move the Aldershot Command into the Chiltern Hills and to clear Dover Harbour of shipping. It is to be hoped that the Air Officer Commanding may have such power to save the Navy and Army from the effects of its own obstinacy. We lost tens of thousands of men in the last war through neglect of just such simple precautions.

Finally he asked for more money for Civil Aviation (anything, you see, to damage the Air Force) on the old foolish plea that civilian aviators will form a reserve of pilots for the R.A.F. Really it is time Sir Henry Wilson left the Air Force alone and reserved his attentions for his own Service.

Lord HUGH CECIL made a very amusing speech, remarking that he had found admirals and generals "quite as ignorant as civilians and a great deal more self-confident" in air matters. He said that every argument Sir Henry Wilson could devise against an independent Air Force was equally good against an independent Fleet.

He confessed that he had more faith in the League of Nations than in our three Home Defence squadrons, which would be futile in case of invasion. He said "if you cannot be formidable the next safest is to be insignificant. . . . No one proposes to bomb Bern or Geneva or even The Hague"—a truly subtle remark.

Colonel WEDGWOOD emphasised the fact that the Air Force is our First Line of Defence, and said that in the end the aeroplane would make war suicidal or impossible. One imagines either that Colonel Wedgwood is an optimist or a very poor student of history.

Lieut.-Colonel WALTER GUINNESS moved a resolution that "to enable the best use to be made of the Air Service all defence forces should be represented on and their activities co-ordinated by the Committee of Imperial Defence," and some more of less interest. He recalled the absence of co-operation in the "amphibious operation" round Gallipoli. He advocated an Imperial Staff College for all Services, and recalled a Memorandum of Lord Randolph Churchill recommending a Minister of Defence with his own Chancellor of Exchequer.

Major HILLS seconded the motion.

Rear-Admiral SUTER was reminiscent of the work of the R.N.A.S.

Lieut.-General Sir AYLMER HUNTER-WESTON also advocated a power to co-ordinate the work of the three Services.

Mr. L'ESTRANGE MALONE made a really brainy speech extending the idea of a Ministry of Defence Staff. He has apparently renounced any ideas he may or may not have had of a Bolshevik World-Peace. He defined the difference between the Air Service as a branch of the Navy and Army

and the Air Force as such as the difference between an adjective and a noun. He recalled historically the outcry of the Army when a Navy was formed and soldiers ceased to fight on ships. And he was reminiscent of his own knowledge as to the Admiralty's inability to tackle air administration, strategy or tactics.

Viscount CURZON did his honest best to make a case for the Navy and denied that the Admiralty was antagonistic to the Air Force.

Captain WEDGWOOD BENN said air co-operation with the Naval authorities always meant the co-operation of the rabbit with the bee-constrictor. He pointed out quite ably the difference between naval aviation and the work of the Navy, and made the fine point that a flying officer should not ask himself: "If I do this what will the General think?" or "What will the Admiral think?" but should ask himself "What will the Air Marshal think?"

Rear-Admiral ADAIR tried to justify the Navy's point of view.

Mr. CHURCHILL repeated the statement that the Air Force was the product of bitter experience in war. He said that "It is perhaps some deep instinct which has taught us that this (a separate Air Force) is of more consequence to us than to any other Power."

## THE RESIGNATION OF SIR FREDERICK SYKES.

It was announced by the Air Ministry on March 21st that Major-Gen. Sir Frederick Sykes, G.B.E., K.C.B., C.M.G., had resigned his appointment as Controller-General of Civil Aviation on the expiration of the term for which he was originally appointed.

The official announcement of this resignation was accompanied by copies of two letters which had passed between the Secretary of State for Air and General Sykes.

The first of these letters from General Sykes to the Secretary of State confirms what had already been understood, that the late Director-General of Civil Aviation had been invited to continue in that position for another year and had accepted that invitation. It proceeds to state that on reconsideration, and in view of the very small scale to which it has been found necessary to reduce the Department of Civil Aviation, General Sykes felt that there was no scope for such an appointment as his, and that he would not be justified in accepting for a year a salary for work which circumstances made impossible of performance, and accordingly he asks that the appointment may terminate on April 1st as originally fixed. General Sykes, however, places his services at the disposal of the Secretary of State if the latter thinks they will be of any value in the re-organisation which is now contemplated in his late department.

To this letter Capt. F. E. Guest replied accepting the tendered resignation and expressing the regret which would be

He asked the House whether it thought the Air Service would get its chance if separated into two parts and one mutilated fragment handed over to the Navy and the other to the Army. He said the Senior Services could not handle air affairs because "it is a question of scrapping all sorts of prepossessions at every step and handing over functions dearly prized and highly valued." As to the risk of the new arrangement he said that the British Empire has been built up by running risks.

He said that if the Army wanted more co-operation squadrons it could have them for the asking (and paying—by means of sacrificing more cavalry). The Navy likewise could have more naval squadrons by paying for them, just as he had squadrons in Iraq for which his Department paid. This, he it noted, opens up a whole new side to the argument with which one hopes to deal later.

Mr. Churchill's speech ended the debate proper. The further speeches on the individual Votes in the Estimates will be discussed in a later issue. Some weeks hence, when certain new developments have taken place, one hopes to deal in detail with certain ideas set forth by various speakers in this debate, which was certainly the best which has ever taken place on Air affairs.—C. G. G.

felt on the termination of General Sykes' association with the Air Ministry, both by himself, by the Air Council, and the Air Ministry.

In General Sykes the Air Ministry loses the services of an extremely able, hard working and enthusiastic servant. He has done very much for aviation, both military and civil, in the past, and doubtless will do more in the future—one hopes, indeed, more even than has been possible to him in the past.

In his private capacity it will be possible for him publicly to expound the policy for the development of civil aviation which he holds alone to be consistent with national security and safety.

With that policy one personally disagrees in very large measure, and one has long felt that the fact that Sir Frederick Sykes held both an important position in the Air Ministry and opinions on aerial policy which one believes to be unsound has been the cause of much that is unsatisfactory in the present state of affairs.

But knowing that he has a firm faith in the future of aviation, one feels certain that, even if one must continue to disagree with him on the details of policy, one will find that his future activities will be of a nature to stimulate public interest in an important and much-neglected subject. For this purpose, an honourable and honoured opponent—such as he at worst will now be—is perhaps a more useful ally than one with whom one too cordially agrees.

## BOMBS V. BATTLESHIPS.

SOME ASTOUNDING MIS-STATEMENTS.

The recurrence of the bomb-battleship controversy during the past few days, coinciding as it does with the temporary absence from duty of the Editor of THE AEROPLANE, arouses in my mind feelings of mixed joy and regret.

Regret because certain recent utterances from the Admiralty call unmistakably for the fullest possible use of that Editor's very remarkable gift of words.

Joy because it allows to me, who differ from him in nearly every respect in my opinion of the Navy, to deal in my own way with the enemies of that Service, whose welfare both he and I have equally at heart.

The Royal Navy—that part of it which does the work—has in my experience always taken a proper and an enlightened interest in aerial developments. As a service which has regularly to handle mechanical appliances it has—so far as the vast bulk of serving officers are concerned—always taken a reasonably sceptical attitude towards the extravagant claims made by the more ardent advocates of the powers of the aerial arm. This attitude, which is that of every competent practical engineer towards a new technical development, is not an unsympathetic attitude. Very roughly, it is that of one who, seeing a new process demonstrated successfully as a laboratory experiment, says: "Yes, very interesting and extremely valuable, and likely profoundly to modify the future of the art. But before I can scrap my present plant in favour of your new process I must have time wherein to prove the new process on a commercial scale and to discover its practical advantages and disadvantages before I adopt it as my standard process."

THE ADMIRALTY AND AIR POWER.

The attitude of the Admiralty itself naturally has been one of much greater scepticism and often of distinct obstructionism, but for a central Government Department the

Admiralty has not been remarkably conservative. It has been known to show enterprise, which is almost unprecedented in any other office lying between Trafalgar Square and the Houses of Parliament.

There is not the least doubt that there are and have for long been those at the Admiralty who have wilfully obstructed the development of naval aircraft. Their task has been rendered the easier by wild and extravagant claims which have been made by some unduly enthusiastic advocates of the Air Services, claims which have also tended to chill the interest taken in aerial developments by the actual serving officers of the Royal Navy.

It is known that aircraft can sink any type of ship yet afloat either with bombs or with torpedoes. It has not been shown that against an adequately organised anti-aircraft defence, and under war service conditions, aircraft as they now are can be regarded as a serious enemy to a battleship. And even when that has been shown, it may still be taken that an effective defence to aircraft attack on ships of war can be carried out by defending aircraft. And that in consequence the surface capital ship will for many years remain a most important unit of naval warfare.

Holding as I do these views, the remarks that I feel constrained to make in reference to the First Lord of the Admiralty's statement in the House of Lords, in reply to a question addressed to him by the Marquess of Linlithgow on March 30th, may perhaps have a greater effect than would an even more powerfully worded comment which came from the pen of one who does not altogether share my views.

No one, unfortunately, would expect a First Lord of the Admiralty to possess any first-hand technical knowledge of such subjects as he had there to discuss, and therefore there can be no question of the noble Lord personally having sought wilfully to mislead either the Marquess of Linlithgow,

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plan central et la queue, etc., sont  
de type normal, et sont construits  
de manière à pouvoir recevoir des  
ailes de types différents, ainsi que  
des châssis et moteurs d'autres  
machines de la série, de manière  
à être appropriés à l'usage auquel  
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machines de cette série ont des  
ailes démontables et repliables et  
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breveté de cambrure variable, qui  
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Departamento de Guerra y  
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hidroaviones, barcos aéreos, aéro-  
planos, aparatos anfíbios, de todas  
clases, también de aparatos espe-  
cialmente adecuados para el  
levantamiento de cartas topográ-  
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estos mismos.Diseñadores, por orden especial  
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struido para este gobierno.Proveedores de todo lo necesario  
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suministrados en grandes can-  
tidades al Gobierno Británico,  
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serie de aparatos, el fuselage,  
el plano central y la unidad  
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fabricados para adaptarse a di-  
ferentes tipos de alas, chassis y  
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tienen alas plegadizas y están  
provistas del dispositivo patentado  
de combeco variable Fairey que da  
una alta capacidad y potencia de  
ascensión combinada con una  
velocidad baja de aterrizaje.



the House of Lords, or the public generally. But although the First Lord's personal honour may be regarded as clear, it is a very serious matter indeed if the official spokesman and political head of His Majesty's Navy should be found to have given, however innocently, information of a false and misleading character on a subject of great public importance.

The essence of Lord Lintilhgow's speech in submitting his question, and the vital portions of the First Lord's reply, are here given in abstract:—

The Marquess of LINTILTHGOW asked the FIRST LORD of the ADMIRALTY whether his attention had been drawn to statements made in another place in March, which it was alleged the First Lord already proved that one bomb can sink the most powerful battleship in a few minutes; and whether the Admiralty holds the view: (1) that the post-Julian capital ships are defenceless against the under-water explosion of bombs dropped by aircraft; (2) that the recent developments in aircraft and in the methods of attack from the air have substantially reduced the fighting value of the capital ship; and to move for Papers.

The noble Marquess said: I put this question because the issues that it touches have been much before the public of late, without so far as the Admiralty making any very clear or adequate statement as to their views on the matters raised. This much is clear, that there has been a persistent and deliberate campaign of advertisement directed to impressing Parliament and the country with the important part that air power is to play in the next war.

The Secretary of State for Air used these words in another place on March 21st:—

"It is already proved that one bomb can sink the most powerful battleship in a few minutes. A battleship may survive a direct surface hit, but you cannot protect it from the explosion of a bomb underneath its war line."

He went on to draw his conclusions, and he used these words:—  
"In ten years' time I believe that a combat between the forces of the air and the forces of the sea will have become a grotesque and pathetically one-sided affair."

I can only say that during the many conversations that I have had with Naval officers on this question of aircraft, I never heard one word which did not make it possible for me to reply in the affirmative.

The remaining portion of the noble Lord's speech was in the same vein. It revealed him as an enthusiastic supporter of the Navy who regards the claims made by the Air Service as of a distinctly bombastic nature. It contained only one really effective point, and one which the supporters of the R.A.F. will do well to remember in the future. It was contained in the following passage:—

"Apart from the question of the protection afforded capital ships against aircraft by the defence of their own structure, there is the point as to how far it is possible for us to credit to our ships against attack by hostile aircraft. I observed with some surprise that the Secretary of State for Air was completely silent on this point."

The reply made by Lord Lee of Fareham was of a most extraordinary nature. It is given hereafter in full.

The FIRST LORD of the ADMIRALTY: I am placed in a position of some difficulty because I naturally dislike having to enter into anything like a public controversy with those who have advanced these very extreme claims, doubting as I do whether the Admiralty cannot, however, permit public confidence in the Admiralty to be undermined without exposing the absurdity of some of the claims advanced.

I will say at once that the statement that "it is already proved that one bomb can sink the most powerful battleship in a few minutes" is admittedly based, and solely based, upon the experiments in America last year. There have been no experiments in America, or elsewhere, against a modern capital ship properly defending itself and not by the use of its own guns, and to deduce these tremendous conclusions from the experiments is really stretching the case too far.

In the case of the *Ostfriesland*, on the first day this stationary target was hit thirteen times by bombs varying from 2 to 30 pounds. The ship was considerably shaken, and the next day was down by four feet, no attempt having been made to shore up her bulkheads or to protect her in any way. On the second day she received thirty more hits at close range by bombs of 1,000 lbs., and finally 2,000 lbs. bombs were dropped close alongside, and she eventually sank. She was a very old type of ship, in bad condition with strained hull and no special underwater protection of any sort or kind.

Therefore no conclusions can be drawn as applying to existing modern capital ships under service conditions.

The joint board of military and Naval men on these experiments reached the conclusion that had the target been moving at high speeds on varying courses the probability of hitting would have been greatly reduced, that had the target been protected by anti-aircraft armament it would have been further reduced, and that it is probable that it would have been practically intact had the target been protected by appliances.

The conclusion is that there was nothing in these experiments to support the extreme theory which was advanced in another place. The most effective method of attacking a battleship by a bomb may be judged by the fact that the effect of a 4,000-lb. bomb, dropped at a distance with the effect of the distance from the side. This leads to the most extraordinary conclusions. A 4,000-lb. bomb, carrying 2,000 lbs. of high explosives, dropped ten feet from the side and at the right distance under water, is equivalent only to a bomb carrying 50 lbs. of explosives in actual contact with the side—that is, considerably less than carried by the ordinary service torpedo. It would take a bomb of 8,000 lbs., bursting at ten feet from the side, to produce the effect of the torpedo exploded in contact with the ship. When I see a distinguished authority stating that a 4,000-lb. bomb, dropped thirty yards from a modern battleship, would be destructive, I would only remind your Lordships that the effect of that bomb would be no more than that of the explosion of 3 lbs. of explosive in actual contact with the ship.

I refer now to ships which are actually in existence, but, as your attack develops, so do the methods of naval construction to meet it. The new designs which we are proposing to construct will be immune not only from direct hits from bombs of the size suggested, but even from this very potent means of attack. I am a member of the committee in the recent debate said that it was only necessary to drop a bomb of 4,000 lbs. within 100 yards of the ship. The actual effect of a 4,000-lb. bomb dropped at 100 yards would be equivalent to the distance of 100 yards, or 2 oz. and 2 oz. of high explosive against the ship itself, and would not have the slightest effect even upon a torpedo boat. I think I have said enough to show that this kind of claim can only be described as rubbish.

There were later experiments on the *Iowa*, which was electrically controlled and under way, but only at a speed of eight knots. Although

attack was made at low altitudes only 15 per cent. of hits were made, and the report states that there would not have been more than 5 per cent. of hits under service conditions. If what is wanted is to drop a bomb on the side of the ship, the target is reduced to a size about one-fifth of the area of the ship, and the number of hits will probably be reduced from 5 per cent. to 1 per cent.

It might be said that accuracy will improve, but so far no solution of that vital problem has been reached. In any case, this form of attack upon warships is only possible from a shore base, and is only applicable to coast defence.

That does not cover attack from aircraft carriers, but no aircraft carrier either actual or projected can carry these huge bombing machines at all, and even if they could, the machines could not return and land on their mother-ship.

So far nothing has been said with regard to defence against attack or to the counter attacks which would be made by the warship itself or its attendant fighting aircraft. General Groves asked his readers to imagine an attack by aircraft, which first make a great smoke screen, out of which would emerge a flight of aeroplanes carrying torpedoes, which they launch and then disappearing again in the smoke screen. The task might equally be performed by destroyers, which carry six torpedoes and can stand a considerable amount of punishment before being disabled, whereas a small shell of any description would wreck an aeroplane. The picture contains nothing new and something less effective than the existing methods of attack, and it does not cause us any acute apprehension.

We hope that by gun fire alone it may be possible to make ships in the near future practically immune against air attack. Any description of the future of the Navy is, however, at best a guess. Further defence in the air of a very far-reaching character, carried out by aeroplane carriers, so far from it being true that the Navy or the Admiralty are to be given up, it is the fact that the development of the Air Service, the fact is that they have long been convinced of its vital importance, and are continually pressing for more progress in this direction.

So far as my knowledge goes, and that of the Admiralty and the Naval Staff, nothing whatever has occurred in connection with recent developments in aircraft or methods of attack from the air, substantiating the fighting value of the capital ship. It is today the considered opinion both of the Naval Staff and of the Board of Admiralty that defence against aircraft is, and will keep, fully abreast of attack from aircraft or from the force of the capital ship.

The Marquess of LINTILTHGOW: I merely wish to thank the noble Lord for the very full statement which he has given, and to ask the leader of the House to withdraw my Motion.

QUESTIONS AND ANSWERS.

Consider now the statements of fact made by the First Lord. The *Ostfriesland* is said to be "a very old type of ship, possessing no special under-water protection of any sort."

The *Ostfriesland* is one of the very latest of the German battleships, and was completed in 1911. The general system of internal sub-division of German warships has always been notable for its thoroughness, and war experience proved it to be extremely effective against under-water attack. The *Ostfriesland* possessed this protective sub-division to a very high degree.

The American experiments, carried out from a low altitude against the anchored *Ostfriesland*, and against the *Iowa* under way at eight knots, are said to be the only experiments whereon the claims made for the effectiveness of aircraft attack are based. Stress is laid on the fact that the percentage of hits made against the *Iowa* was very small.

The Admiralty knows very well that certain tests made against another battleship under way, carried out not by Army bombers devoid of experience in such attacks, but by properly trained pilots and bombers who have specialised in naval bombing, have shown that it is possible to score a very high percentage of hits from a very great altitude against such a moving target. If the First Lord is unaware of the facts, it is high time he discovered who it is who has concealed them from him.

#### FICTION.

The First Lord then proceeds to discount the effect of explosions at some distance from the side of the ship by the aid of the statement that the effect of such an explosion varies as the cube of the distance from the ship. This statement of the cube law is mathematically correct only for one effect of an imaginary explosive in an imaginary fluid.

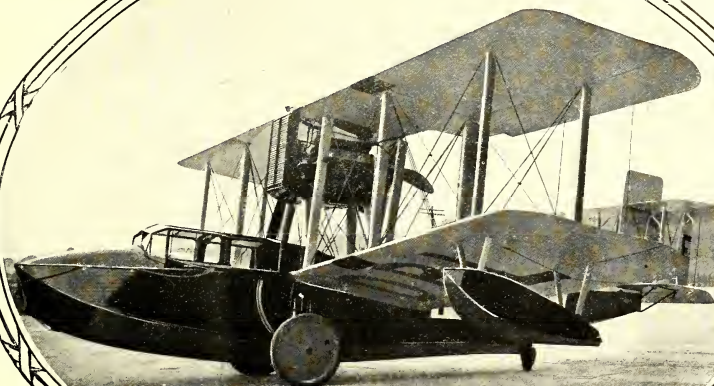
In an inimitable and perfectly inelastic fluid, the pressure per unit of surface produced by an explosion which occurs at a mathematical point may vary as the cube of the distance from that point. Within a very short radius of an actual explosion water may behave as a very imperfectly elastic fluid, but the pressure even then will not vary as quickly as the cube of the distance. Outside this very small radius the pressure will vary nearly as the square of the distance. Actually since the type of explosion considered occurs near the water surface, the explosion waves that travel up to the surface will then be reflected down and will increase the effect on a target near the surface.

But the damage done to a ship by such an explosion cannot be measured as simply as all this. A small explosion close to the side will punch a small hole in the plating. The pressure needed for this purpose is very great—it will require something like 15 tons per sq. in. to punch a 1-in. diameter hole in 1-in. plating. But, on the other hand, a large explosion, even if it does not produce a much less intense pressure, it will therefore not do any damage as absurd as to allege because a similarly high pressure is needed to punch a small hole in a bridge girder, that therefore one can load

(Continued on page 251)

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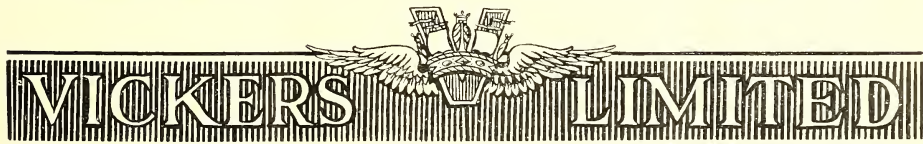
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## THE WEEKLY COMMENTARY.

Capt. G. de Havilland is admittedly among the most successful and experienced of commercial aeroplane designers, and his views, put forward in the paper which is abstracted below, must command attention from all who are interested in commercial aircraft, for though one may disagree with his views one cannot neglect them.

The statements made in this paper with regard to the DeH. monoplane are of some importance, and the admittedly incomplete data as to the performance of that machine will be found to confirm in a somewhat striking manner certain views recently put forward by Capt. Sayers.

The discussion reveals a wide divergence of opinion between Capt. de Havilland and others on the subject of safe landing speeds.

The description of the details of the DeH.34 machine given last week is supplemented in this issue by photographs of the complete machine.

The results of preliminary tests of the Bristol "Jupiter" engines fitted to an O/400 type Handley Page machine are recorded in this issue.

## THE DESIGN OF A COMMERCIAL AEROPLANE.

The paper under the above title, read by Capt. G. de Havilland before the Royal Aeronautical Society on March 30th, must be regarded as a statement of the considered opinions of one of the most experienced and successful of present-day designers on a subject of the very first importance. The following is a brief abstract of the paper and of the discussion which followed thereon.

### THE PAPER.

To keep the paper within reasonable limits of length the paper was confined to the discussion of a typical machine and of the reasons leading to the choice of that type.

With a given engine the problem of choice of type lies firstly between the single and the multiple engine type. Admitting that the multiple engine type will continue to be built and that there are possibly sound reasons for its continuance, the author for reasons which are known to all those who have followed recent discussions on the subject accepts the arguments for the single engine type.

The question arises is this machine to be a large slow machine, or a small fast one?

### WING LOADING.

This brings one to the question of wing loading. A relatively heavily loaded machine is fast, of low first cost, and economical to run and to maintain. It is therefore in every way desirable if the higher landing speed can safely be dealt with and if the "get-off" is satisfactory.

The chief disadvantage of high landing speed is the long run after touching, but this can be dealt with by providing for a large ground angle so that wings act as an effective air brake. A test at Martlesham on a R.A.F.15 winged machine loaded to 11.3 lbs. per sq. ft. in a 5 m.p.h. wind gave a pull up in 163 yards with a ground angle for the wings of 17 degrees. Any reasonable landing shock can be looked after by adequate undercarriage design. This type of machine in service has never suffered an accident which could have been avoided had the landing speed been lower.

Wheel brakes are not considered satisfactory—as if the

wheel is caused to skid by the brakes, the retardation of the locked wheel is no greater than that of a free wheel.

The various methods which have been suggested for increasing lift and so reducing landing speed have not yet been sufficiently developed to warrant a definite statement as to their practical value. But if one attempts to visualise machines with surfaces very much smaller than existing aeroplanes it is obvious that new difficulties will crop up, particularly in the matter of control. These difficulties might be insurmountable—or surmountable only at the expense of too great a sacrifice in other directions.

It is essential to specify a "get-off" which will be safe under all reasonable conditions. Full scale tests indicated that in service conditions the safe "get-off" limit required that a height of 50 ft. be reached 450 yards from standing start in a calm. The condition can be fulfilled by a machine of light loading and high weight. The lightly loaded machine is larger and more costly, costs more to house, to handle, to maintain and to insure than the heavily loaded type. Petrol and oil consumption per mile is greater, and the percentage loss of ground speed in adverse winds is higher. It has a greater load capacity, and setting off advantages and disadvantages it appears that the most economical machine for a service such as London-Paris would be one with a stalling speed between 58 and 62 m.p.h.

The best compromise between all requirements would seem to be a comparatively small machine of fairly heavy wing loading. Such a machine, for a 450 h.p. engine, would carry 2,000 lbs. of useful load at a cruising speed of 100 m.p.h. with a range of 350 miles.

### MONOPLANE V. BIPLANE.

Whether the machine should be biplane or monoplane is an open question to be decided by tests and experience. Theoretically, the monoplane seemed to offer only small advantages. But it seemed that if aerodynamically it were just the same as the biplane it would have the advantage of simplicity and fewness of parts.



Two views of Capt. de Havilland's latest Commercial Machine, the D.H.34 (450-h.p. Napier engine.)

In a preliminary lay-out it was estimated from the qualities of known wing sections that a lift coefficient of 0.7 could be attained. Model tests of the complete tapered wing showed a better figure than the estimate, and tests of the complete model showed a still higher figure of 0.86. Estimates of structure weight showed that this would not exceed that of the equivalent R.A.F.15 biplane, and the actual machine bore out these figures.

No official performance tests are yet available, but preliminary works tests gave a speed of 116 m.p.h., at 10,000 ft., and a landing speed on 15 lbs. per sq. ft. of 54 m.p.h., which seem to confirm the fact that the model tests were reliable. The machine has interesting and difficult features.

It was expected that the airscrew would have a difficulty with standard engine speeds, and experience shows that a lower speed of rotation of airscrew is needed. Small variations in the arrangement of obstructions in the slip stream have a great effect on performance and controls have shown unusual features. Lateral control is good, but rudder and elevator controls are "soft," and there is no rudder control when "taxiing." The stability tends to be more marked than in usual types.

A practical point with this type is that spars take up a great deal of room in the cabin and that spare wings cannot be transported as easily as can biplane spars.

It is obvious that the cantilever monoplane has very great promise, and it remains to work out the incidental difficulties and to transform promise into performance.

#### CONSTRUCTION.

It is difficult to find any advantage in metal construction for normal climates at present. The idea of superior safety of metal is not warranted by evidence. Metal is more costly, and liable to be heavier unless excessively costly. Owing to difficulty of protecting very thin metal from corrosion it is doubtful if metal will be as durable as wood. Metal will find its place in the future and for tropical or extremely variable climates may be an immediate necessity, but further data as to what really happens to wooden craft is necessary.

Commercial craft must be cheap and therefore of the simplest possible construction, and it seems certain that timber will hold its own for such machines in normal climates for some time to come.

#### CONTROLS.

The control mechanism is of vital importance both aerodynamically and structurally. Ball-bearing for controls will probably be universal in the future. Ball-bearing controls are easier to work and do not require constant lubrication and they obviate backlash. Backlash is common with plain bearings and is the probable cause of "sogginess." "Sogginess" is almost certainly due to lag in controls and the feel of loss of performance all round. That performance actually falls off with age, is not supported by evidence.

Fairleads and pulleys eventually lead to fraying of cables; they should be avoided, or cables should be replaced by a short length of bicycle chain round a smooth pulley.

More ample controls are needed at low speeds. A development in connection with lateral controls which has been found effective is a differential aileron movement, such that the pulled down aileron moves a less distance than the pulled up aileron. This produces partial balancing and has less tendency to produce yaw. This system has been found to be satisfactory in both monoplane and biplane.

#### ENGINE INSTALLATIONS.

The detachable engine mounting does not seem to have proved necessary in service. It may be found valuable in the future when machines are run harder. It is an advantage during construction, and it allows different engines to be installed in the same machine with minimum modification. Improvements needed in installations are chiefly in the direction of durability and accessibility. Cowling is always a difficulty and the best treatment is to do without it—as far as possible.

A detail calling for attention is the absence of methods for starting. Electric self-starters are little or no use and are deadweight. A suitable hand turning gear should be satisfactory if doping and ignition systems are improved for starting conditions.

#### STABILITY.

Commercial machines should be capable of flying "hands-off" under all reasonable conditions. There is no difficulty in providing the required degree of stability, but if the machine is stiffly stable the difficulty of control at low speeds is increased. If a machine is stable enough to fly "hands-off" there should be no difficulty in keeping right way up in a fog. The difficulty is then only directional, and should be removed by the use of a suitable turn indicator. It might be advantageous to fit a temporary hand operated rudder for fog flying.

#### PETROL SYSTEM.

The best possible system is the gravity type. Carburettors

are, however, usually designed so as to require a considerable head when getting off and it would be a gain if the required head could be considerably reduced. Pressure feed is rather lighter and simpler than pump feed; both are considerably heavier and more complex than gravity. The safest place for petrol tanks is probably under the top plane just out of the slip stream.

Rubber joints are a source of trouble, soft steel piping seems to be reliable, and Petroflex gives the advantages of flexible tubing combined with durability.

#### PASSENGER ACCOMMODATION.

Seats in two rows with a central gangway are preferable to a three or four row arrangement as each seat can be a window seat. The specially designed wicker chair is so far the best seat. Decoration of cabin is largely a matter of taste, but it is necessary to choose a durable scheme. Weight must be watched carefully—as it is easy to throw away 100 lbs. in paint and varnish. A minimum headroom of 6 ft. 3 in. should be provided and there should be no obstructions. Heating and ventilating should be adequate and there is no reason to expect serious difficulty in either respect.

The luggage compartment should be entirely separate and have its own entrance.

A modern single engined commercial machine it is suggested has a much greater durability than is usually supposed and the cost of maintenance should be extremely small. It should be capable of service for at least three years and probably longer—covering a distance of at least half-million miles. The present mileage between engine overhauls is from 15,000 to 20,000 miles—comparing well with any type of motor transport.

Experience has shown that chief items of maintenance costs are renewal of control cables (owing to fraying), of shock absorbers, of the wearing parts of petrol pumps, of tail skids and of tyres. All these troubles have been eliminated in the latest designs except the tyres, and the use of solid tyres is now under consideration.

#### THE DISCUSSION.

Major F. M. GREEN could not agree as to Capt. de Havilland's views on metal construction. Metal was expensive at present because we do not yet know how to use it. Wooden construction was the result of a technique developed by extensive experience, and when the technique of metal construction was equally developed it would be possible to make metal machines a little lighter and a little cheaper than wooden ones. He had no fear as to the durability of metal structures, and there was the possibility of using stainless steel. He agreed as to the ordinary type of multi-engined machines, for no existing twin-engined type will fly with full load on one engine. He thought, however, that the triple engine type had greater possibilities, particularly if multi-engine units could be evolved. Advantages seemed all with the tractor type, and the multi-engine unit gave the advantages of the type and of the multi-engine features. Reliability of modern machines was now very considerable, but forced landings do occur, and the risk of forced landing led to pilots flying at a height dictated by the possibility of having to land, instead of by the wind and weather conditions.

Mr. W. O. MANNING said that he could not link on the question of landing speed quite as Capt. de Havilland did. He regarded low landing speed as a guarantee of little risk in the event of an accident. As an example he instanced the old Anzani Bleriot with their very low landing speeds. People took tumbles in them and were never seriously hurt. When the 50 Gnome Bleriot with increased landing speed was used a toss usually meant much more serious hurt. He agreed with the lecturer as to the present state of metal construction.

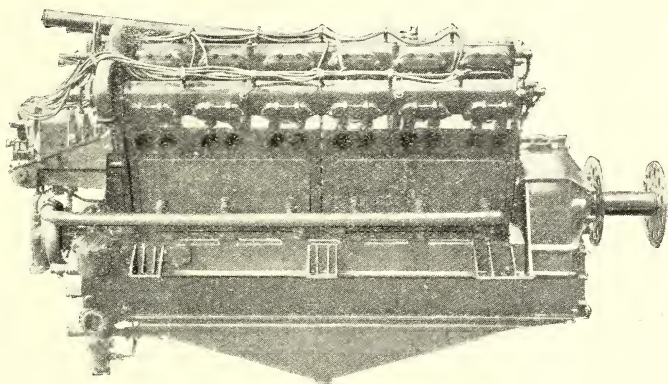
S/Ldr. R. M. HILL thought Capt. de Havilland had not fairly stated the case for the twin-engine machine. It was more liable to partial breakdown, but the great danger to the pilot was complete cutting out. The twin gave assurance that complete cut out was improbable and one had at least a much greater chance of landing ground. With improved design the twin would allow one to complete the journey on one engine. As a pilot he could not view with equanimity the prospect of still higher stalling speeds, and he did not like the high undercarriage needed to give the high wing angle on the ground. He agreed that "sogginess" was usually due to mechanical faults in controls.

Mr. HANDLEY PAGE said that he thought high landing speeds were a danger. He had been told by insurance authorities that they could consider reducing insurance rates when landing speeds were brought down below 50 m.p.h. They must, however, load up to secure economy—and the way out of the difficulty seemed obvious to him. However, this was no place for him to advertise his own wares. He thought that for present sizes wood had the advantage—one built *Maurelantas* of steel, but light launches of wood.

Engine troubles were installation troubles, and when they could get a sound installation the multi-engined type would hold the field.



# SUNBEAM-COATALEN AIRCRAFT ENGINES



## "MATABELE"

400 H.P. 12-CYLINDER  
AERO ENGINE



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The following list of Engines, designed and manufactured by the Company, is unequalled in its range. All these engines are of proved efficiency and extreme reliability, and can be recommended with confidence for aviation purposes of all kinds.

"DYAK"	.. ..	100 h p	6-cylinder
"ARAB 2" (Direct Drive)	.. ..	200 h p.	8-cylinder
"MANITOU"	.. ..	300 h.p.	12-cylinder
"MATABELE"	.. ..	400 h.p.	12-cylinder
"SIKH"	.. ..	800/1000 h.p.	12-cylinder
"MAORI"	.. ..	275 h p.	12-cylinder
"COSSACK"	.. ..	350 h p	12-cylinder
"SIKH"	.. ..	400/450 h.p.	6-cylinder



Major R. H. MAYO said Capt. de Havilland was the pioneer of the heavily loaded high-landing speed machine and had in this respect rendered a great service to the Allied cause. That type had been surprisingly successful, but he thought the absence of accidents with D.H. commercial aircraft was due to the small number of forced landings. But he suggested that the risk of a forced landing at high speed led to the abandonment of many flights which would have been possible otherwise. He instanced the Farman "Goliath," which had the lowest landing speed of any modern machine and brought off enormous numbers of forced landings with very few serious accidents. In the French Grand Prix the "Goliath" had triumphed because it had successfully brought off three forced landings in bad country at night. A French pilot on one of these machines broke a crankshaft five minutes after leaving Rotterdam; he carried on on one engine to Brussels, which showed an advantage on the side of the lightly loaded low-speed type.

Colonel BRISQW asked that a little more attention to the pilot's view, particularly to giving view on both sides, to the provision of adjustable controls, and the fitting of wireless gear after a less "Christmas-tree" style were needed. The present lack of accidents with machines such as Capt. de Havilland advocated were due to causes which would not or should not continue. We had only a small number of such machines, but even so there was a shortage of pilots fit to handle them. In France, where there was much more flying and the pilots were not of so high a standard, heavily loaded types showed a high percentage of serious accidents, while the lightly loaded types, with an equal percentage of forced landings, had very few serious crashes.

Lt.-Col. M. O'GORMAN said that the present controversy as to high versus low landing speeds was acute, but would be settled in the future by the advent of reliable engines. Personally he agreed that wood would hold its own for some time against metal.

Capt. de HAVILLAND, in reply, agreed that metal had advantages and would have its place in the future. But time factor is important and at present a metal machine would take three times as long to build, unless they could be built in lots of 100 or so. He did not think anyone had yet made a case for the metal machine, except possibly for extreme climatic conditions.

He was glad to hear that the multi-engine unit was receiving attention. He was dealing with present conditions, and the multi-engine unit was of the future.

He did not think the 63 m.p.h. landing speed was as dangerous as some people urged. Of course one would land as slowly if possible, but it was difficult to make a cheap and fast machine to land slow. The really important matter was the distance of pull-up. In fog any landing speed was dangerous, and the danger was equal if the pull-up was the same.

The difficulty as to gravity feed was that the acceleration at getting-off sometimes doubled the head needed—that is, if 2 ft. were enough in steady flight, 4 ft. might be necessary getting off.

### AN ANGLO-FRENCH TECHNICAL DICTIONARY.

In a review of an Anglo-French dictionary of technical terms relating to motor cars some time ago attention was drawn to the very grave risk incurred by the compilers of such a dictionary owing to the fact that technical terms may have a specialised meaning in connection with a specific art, but

that a general translation based on that special meaning might lead to serious misunderstanding.

In a little book issued by the firm of Gauthier-Villars et Cie., of Paris, entitled, "Lexique Technique Anglo-Français," by G. Malgou, with the collaboration of M. Desmarests, this danger is further illustrated.

It would appear, however, that in this case a considerable ignorance of the English language must also have played its part, for there are many alleged English words included which one is perfectly certain are not English, and among them many others which, even if they were English, would not bear the interpretations given to them. Even where the words are English, entirely erroneous and unaccountable mistranslations occur. For instance, "To abstract" is translated into the French equivalent of "To make an estimate," and "to allow" as "to coagulate."

With very great regret—for the author has evidently spent very much trouble on the work—one must warn those who seek for a technical dictionary of this type against putting any reliance on this work, for it is not only subject to a very great extent to the fault of accepting an idiomatic and partial equivalent as a true equivalent—it also contains many complete mistranslations.

### A FRENCH GUIDE TO AEROPLANE STRESS CALCULATIONS.

It is very generally believed in this country that particularly in the matter of stress calculations French aeroplane design is carried out by methods of a distinctly more empirical nature than those practised in this country.

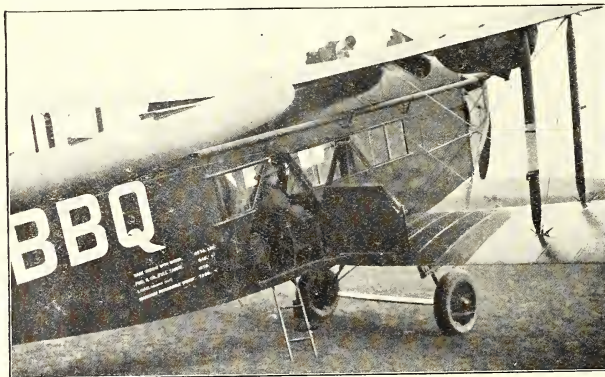
Whether that be true or not, it is now obvious that there is no excuse for the employment of such unsatisfactory methods which can be based on ignorance of the large amount of investigation and research work which has been carried on in this country both on the probable loads to which an aeroplane may be subjected, and on the development of methods of practical stress calculation.

The subject of this present review is a book entitled "Application de la Résistance des Matériaux au Calcul des Avions" by M. M. Bollève, Professor at L'Ecole Supérieure d'Aéronautique, printed and published by Gauthier-Villars et Cie., 55, Quai des Grands-Augustins, Paris.

The general scope of the book corresponds very closely to that of the well-known work of Pippard and Pritchard on "Aeroplane Structures." That is to say that it deals with the estimation of aerodynamic loads, both in normal and in abnormal flight, and the methods of estimating the capacity of the structure to withstand such loads. The methods put forward by the author correspond precisely and exactly to the methods current in this country, and to a very large extent information of English origin is drawn upon and to some extent acknowledged.

It is therefore extremely curious to discover that the very complete and accurate solution of the problem of the continuous beam, originally published by Messrs. Harris Booth and Harold Bolas in 1915, and simplified by Mr. Arthur Berry in 1916, is here given in the latter's terms—with a few very minor modifications of notation—without any acknowledgment whatever. Even the tables of Berry Functions, which are given in their entirety, carry no sign of their parentage.

It may be regarded as a high compliment to British workers on this subject to find that their work is properly appreciated in France, and one trusts that the coming generation of French designers will make adequate use of M. Bollève's translation of the standard British methods of structural design.—W. H. S.



**THE D.H.34 BIPLANE.**—This photograph shows the first completed machine of this type, and gives an excellent idea of the cabin accommodation. It shows the ample entrance door to the cabin, the folding ladder and the seating accommodation.

The luggage door is invisible, but is actually included. The second "B" of the identification letters is mostly painted upon this door. It can be seen that there is ample head-room in the cabin, and that it is excellently lighted both by side windows and by roof lights.

## AN APPRECIATION OF THE DH9c.

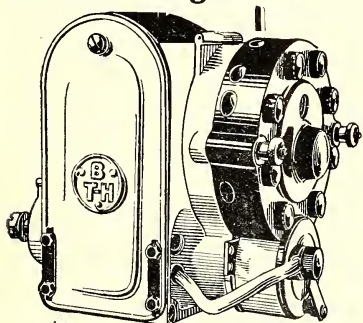
The following is an extract from a letter recently received from the Compañía Española de Tráfico Aéreo—the Spanish aerial transport company which is running the Seville-Larache Air Line:—

“On the occasion of the completion of the first three months during which we have been operating the first Spanish air service between Sevilla and Larache, we should like to take the opportunity to place on record our satisfaction with the material and personnel provided by you. Using these exclusively, you will be pleased to hear that we have, since the inauguration of our service on October 15th, 1921, till January 15th, 1922, successfully completed 85 return journeys. This represents 42,500 kilometres covered without difficulty or mishap and an incalculable saving in time and increase in regularity over the existing means of transport.”

The above company is using DH9c machines exclusively supplied by :

**The De Havilland Aircraft Co., Ltd.,**  
**Stag Lane Aerodrome, Edgware, Middlesex, England.**

### Notable Successes with **B.T.H. Magnets**



B.T.H. Magneto,  
 Type A.V.8.

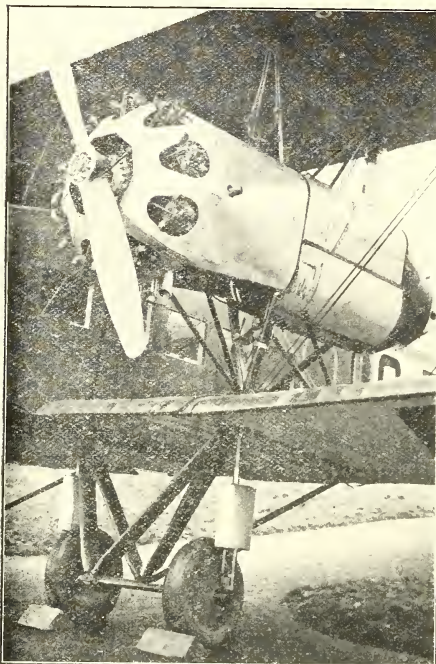


**The British Thomson-Houston Co., Ltd.,**  
 Lower Ford Street - - - - - **Coventry.**

- 1919—British Altitude Record (approximately six miles).  
 Fastest time London-Amsterdam (2 hrs. 10 mins.).  
 Fastest time London-Paris-London (1 hr. 20 mins.;  
 1 hr. 38 mins., both journeys on same day).  
 First Place at 145 m.p.h. in 137 metres Closed Circuit  
 Race at Amsterdam Aero Exhibition.  
 First Non-Stop Flight London-Madrid (by aeroplane).  
 First Flight across Atlantic (by Airship R.34).  
 Eighteen British Records made in one day, by one  
 Pilot on one machine.  
 First and Second Places secured in Aerial Derby.
- 1920—World's Record for useful load carried, height and  
 duration.  
 British Speed Record (166½ miles per hour).  
 Secured five out of eight prizes awarded in Air Ministry  
 Trials at Martlesham Heath.  
 First and Second Places in Aerial Derby.
- 1921—First, Second and Third Places secured in Aerial Derby.  
 Also First and Second Handicap Prizes.

**B.T.H. Magnets also helped to create the latest Speed  
 Record held by the Gloucestershire Mars**





The housing of the "Jupiter" Engine in a Handley Page machine.

### BRISTOL "JUPITER" ENGINES IN THE O/400 HANDLEY PAGE.

Now that the 400-h.p. Bristol "Jupiter" engine has emerged successfully from its type tests, its performance in a well-known standard type of aircraft is the more interesting.

As is known, an O/400 Handley Page which had for some time been running on the regular London-Paris air route was taken to Bristol and had the "Jupiters" fitted. The accompanying illustrations show the manner of fitting, and it will be noticed that these engines protrude in advance of the leading edge of the main planes considerably more than is the case of the standard engines.

Owing to the decreased weight of these air-cooled engines, the total weight of the machine was decreased by 900 lbs., or the equivalent of five passengers and their luggage, and the horse-power was increased by 80.

On actual test, with 14 passengers and ballast totalling 12,000 lbs., the climb to 5,000 ft. was accomplished in 6 min. 15 sec., which compares wonderfully well with the performance of the standard O/400. The take off on that occasion was most remarkable.

The machine was tested in the air very thoroughly at Croydon by the Handley Page Transport pilots, all of whom spoke very highly of it, and was then flown to Paris in three hours against a stiff head wind.

As already stated in the Croydon notes the French Air

authorities thought very highly of the engine and the fact that so well-known a firm as the Gnome and Le Rhône Co. have acquired the French building rights is sufficient criterion of French opinion.

The engines are fitted with the Bristol gas-starter, and all who have watched the starting operation, even on a bitterly cold day, cannot but be favourably impressed with the simplicity of the process. On many occasions an engine has been purposely stopped in the air and on practically every occasion has been easily restarted by the gas-starter when flying level.

During one ceremonial visit of important people in Paris, the engines were stopped and restarted by the gas-starter time after time. One of the party regarding the small stature of the pilot remarked that it seemed that even a baby could work the starter.

### THE RESISTANCE OF RADIATORS.

According to "Les Ailes" M. Lamblin has just carried out a series of experiments with a Breguet 14B.2 in which two Lamblin radiators were substituted for the usual nose radiator. The modification gave some very favourable results, the redesigned nose and cowling making a considerable difference in the performance of the machine. The tests, which were carried out with a useful load of 750 kgs., with bombs in place under the wings and complete armament, were made on the S.T. A6 course, and in the speed test an average of 179.642 km.p.h. was made, which shows an increase of 24 km.p.h. over the acceptance speed of the 14B.2. On the kilometre course a maximum speed of 185.56 km.p.h. was reached. Again, on the S.T. A6 course, which measures 4.6 kms., a slow speed of 55 km.p.h. was maintained, which, with full load, shows the machine to possess more than the usual efficiency. In the altitude test a 1,000 metres was reached in 5 min. 25 sec., 2,000 metres in 6 min. 45 sec., 3,000 metres in 13 min. 30 sec., 4,000 metres in 22 min. and 5,000 metres in 34 min. This test was not carried further owing to the official barometer not registering higher than 5,000 metres.

All these tests were officially observed and timed and they show that the machine has a climb 40 per cent. better than the standard acceptance figures for the Breguet 14B.2.

M. Lamblin is to be congratulated on carrying out this modification, and the results obtained show that the experiments are well worth pursuing in various directions.

### CELLON.

One of the most interesting stands at the recent British Industries Fair at the White City was the exhibit of Cellon (Richmond) Ltd. The firm showed how they convert their aeroplane dope to domestic uses. When used for other than aircraft it is known as "Ceriec."

The well-known "Pears' Golden Series" is now coated with Ceriec and there are quantities of other useful domestic articles all of which are the better for such treatment. Bathroom tiles, taps, and even the bath itself, take on a magnificent polish at the hands of Mr. H. Lazell, who is the chief chemist in the Cellon factory.

Golf clubs, cricket and hockey balls are rendered waterproof and more durable by the action of Ceriec.

### THE INSTITUTE OF AERONAUTICAL ENGINEERS.

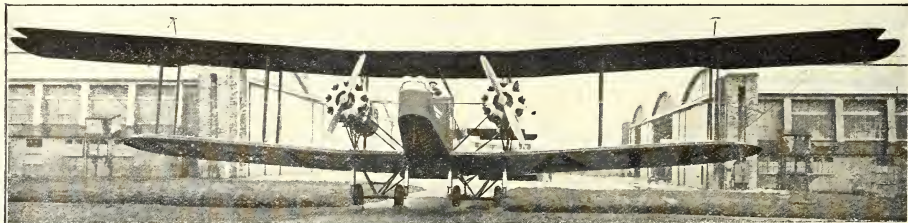
The following fixtures have been arranged for the month of April:—

April 12th, at 3.0 p.m.—Visit to the works of Simms Motor Units (1020) Ltd.

April 28th, at 6.0 p.m.—Paper on "Some Unsettled Problems of Aeroplane Design," by Capt. W. H. Sayers. At the Engineers' Club, Coventry Street, London, W.1.

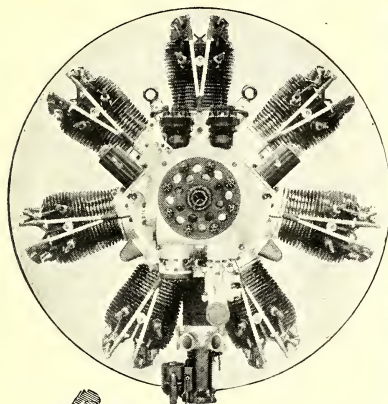
### MORTGAGES, CHARGES & SATISFACTIONS.

TRIPLEX SAFETY GLASS CO. LTD.—Deposit of deeds (without instruments) on Feb. 22nd, 1922, to secure £30,000 charges on Triplex Safety Glass Works, Willesden. Holders: Cox and Co.

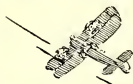


The Handley Page O/400 machine fitted with two Bristol "Jupiter" engines, each of 400 h.p.





The Armstrong Siddeley  
150 h.p. Radial Engine.



Latest Models:


45 h.p. 2 cyl. Armstrong Siddeley Aircooled.  
150 h.p. 7 cyl. Arms rong Siddeley Radial.  
300 h.p. 14 cyl. Armstrong Siddeley Radial.



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Telephone: Gerrard 6139. Telex: "Armstdco, Picky, London."





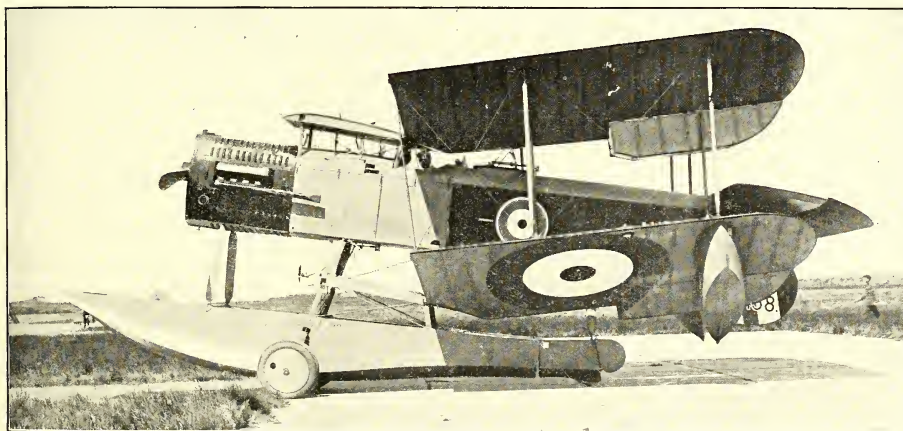
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Edited by C. G. Grey.

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The arrangement has been modified in a manner which will increase its value as a work of reference

It contains accurate information as to the progress of aviation during 1921 in all the civilised countries of the world.

It describes EVERY type of Aero Engine which can be discovered to have been in current use in 1921.

It contains accurate descriptions, specifications, and illustrations of nearly 300 distinct types of aeroplanes which were either built or in regular service during 1921.

The section dealing with airships gives an accurate account of the present position in regard to this type of aircraft.

Sections dealing with the helicopter and with gliding and soaring craft are included.

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14, Bream's Buildings, E.C.4.

KINDLY MENTION “THE AEROPLANE” WHEN CORRESPONDING WITH ADVERTISERS.

(Continued from page 240.)

a complete bridge to 150 tons per sq. in. over its whole surface without breakdown.

The absurdity of Lord Lee's argument is apparent, for even he admits that a big enough bomb at an appreciable distance will sink a ship. And, by his cube law, it follows that an infinitesimal explosion at no distance must equally sink it. And he expressly denies this result of his own reasoning.

Lord Lee stated that a 4,000 lb. bomb exploding at 100 yards would have an effect no greater than that of a few ounces exploding in contact with the ship. This is false. A pound or so of T.N.T. exploded at a distance of 1 in. from the ship's side will produce a pressure of the order of 50 tons per sq. in. on a very small area, and may or may not produce a hole. Two thousand times that quantity of explosive will produce a very much less pressure—according to Lord Lee's cube law a pressure one twelve-millionth of the intensity due to the single pound—over the whole submerged area of the ship. The result will be, even on his basis, a total force of many tons exerted to wrack and stress the ship. According to more probable hypotheses, the total force exerted on a ship 600 ft. long, weighing 25 ft. will be measurable in tens of thousands of tons, and the stresses on the structure will certainly strain it severely. It will also possibly derange much of the ship's internal mechanism.

The mere surface disturbance caused by such an explosion

would suffice seriously to endanger the safety and stability of any battleship. It is unthinkable that any person possessing any practical knowledge of the effect of large under-water explosions should believe that these effects can be discounted by the aid of this hypothetical and certainly incomplete cube law.

There are certainly officials in the Admiralty who are aware of the facts, and it is difficult not to believe that Lord Lee has wilfully been supplied with entirely misleading information by someone who desires to conceal the truth.

Considering the very vital importance to this country of an adequate defence at sea, such an attempt to disguise the actual state of aerial attack, by a tissue of statements false in both fact and implication, must be regarded as scandal of the first order. It is evidence of a wilful desire on the part of some section of the Admiralty not merely to discredit the Air arm, but to resort to the most unscrupulous methods in its attempts in that direction.

The affair is the more serious that in only a tithe of the words he actually used, and those recorded above are but a fraction of the whole, the First Lord could have made a thoroughly sound and convincing case for the retention of the very few battleships which are permitted to us by the Washington Treaty, and that therefore the Admiralty have not the excuse that their existence depends upon the discrediting of aircraft as a naval weapon.—W. H. S.

## R.A.F. SPORTS AND PASTIMES.

### Cranwell.

The R.A.F. College beat the R.M.A. (Woolwich) at Woolwich on April 1st by 5 events to 4. Cranwell won the 100 yds. (M. G. Hayter, 10.4th sec.), the High Jump (F. E. Nuttall, 5 ft. 8 in.), putting the weight (J. S. Newall, 30 ft. 11 in.), the Long Jump (F. E. Nuttall, 19 ft. 11 in.).

RUGBY.—The record of the Station Fifteen to date is excellent and everything points to a satisfactory conclusion to the season. Rugby has increased in popularity among all ranks. A match of special interest was the cup-tie between the Fifteen and the Cadets, which finally ended in a victory for the Fifteen by 10 points to nil. F/Lt. C. N. Lowe has proved invaluable as a coach, and the improvement in both the Station Fifteen and the Cadets Fifteen due to his unceasing efforts is marvellous. The next important match was the semi-final of the Cup competition, against Leuchars, at Cranwell. Half-time arrived with no score, and only after fifteen minutes after play began again McHardy crossed over for 3 points to nil. We have now to meet Flowerdown in the final.

The success of the Station Fifteen has been largely due to the splendid efforts and management of S/Ldr. A. McHardy, who is also a very fine threequarter. F/O. Milne is also a good threequarter who tackles well, and AC. Slack is exceedingly fast and has a deceptive swerve. F/Lt. Simpson has produced a fit and formidable pack, and great credit is due to his efforts.

### 28 Squadron, Kohat (India).

ASSOCIATION.—On the Gymkhana Ground on Feb. 22nd, the second eleven beat the 22nd M.T. Co., R.A.S.C., by one goal to nil. Play in the first half was slow, but both teams pressed hard in the second half. After twenty minutes' play an excellent pass by AC. Bilner, the wing man, enabled AC. McDonald to score.

On the same ground the following day the Squadron eleven beat the 1st Batt. Border Regt. by 2 goals to 1. This was a hard fought game, particularly good play being shown by AC. S. Shipley and Marshall for the defence, and AC. Jones in goal. The Border Regt. started the scoring, but late in the game the R.A.F. forwards took possession of the ball and scored twice, AC. S. Riley and Durham doing the actual scoring.

HOCKEY.—28 Squadron beat Supply and Transport, Kohat, on the Gymkhana Ground, on Feb. 28th, by 6 goals to 3. The game was fast from the start, and by half-time AC. Thomas had scored two and Cpl. Woods and AC. Bilner one each for the Air Force. In the second half Supply and Transport tried hard to equalise, but AC. Hobbs at back was too good for them. They broke through twice, however, the R.A.F. keeping well up with them, AC. Bilner scoring again and F/Lt. Lindop scoring a goal.

SPORTS.—The Squadron Sports took place on Sunday, Feb. 26th, principally to decide who were to represent the Squadron at Amkals for the R.A.F. Sports week. Points were also allotted for the Flight Competitions for the Barton Cup, which includes football, hockey and cricket. The result of the competition is that "A" Flight wins the Cup, "C" and "B" being runners up.

### Uxbridge.

ASSOCIATION.—The Depot bridge had a day out on the 18th, each of the three teams recording a win. At Uxbridge the Depot team beat Maidenhead by 4 goals to nil. At Teddington the second eleven beat Lensbury Athletic by 5 goals to 2. At Sudbury the third eleven beat Sudbury Town by 4 goals to 2.

HOCKEY.—On March 15th the R.A.F. Depot beat St. Mary's Hospital by 9 goals to 2 at Wembley Park. Playing against Wembley at Wembley on March 18th, the Depot won by 5 goals to nil.

### No. 11 Irish Wing.

A dinner is being arranged for all officers who served in No. 11 (Irish) Wing, R.A.F., at the Hotel Cecil, Strand, W.C.2, on Saturday, April 22nd, at 7.30 p.m.

The price of the dinner, exclusive of wines, will be 20s. 6d. and will be collected from officers at the dinner. Will officers who wish to attend please send their names to F/Lt. C. J. Mackay, Room 664, Air Ministry.

Dress: Dinner Jackets. (Miniatures will not be worn.)

### AN UNCONFIRMED RUMOUR.

A report has been published in the Press to the effect that the Air Ministry, the Royal Aero Club, the S.B.A.C., and the Royal Aeronautical Society have arranged to hold a week's Aerial Festival at Croydon during 1923. Neither the Air Ministry nor the Royal Aero Club have official cognisance of the scheme.

### A PORTUGUESE TRANS-ATLANTIC FLIGHT.

The Fairey-Rolls Royce seaplane, which was illustrated and described in Aeronautical Engineering of January 18th, without any hint as to the purpose for which it was destined, was in fact built for the Portuguese Government in order to make an attempt on a trans-Atlantic flight between Lisbon and Brazil.

This attempt was opened on Thursday, March 1st, by the departure from Lisbon of Capitao Gago Coutinho and Capitao Tenente Saccadura Cabral, both of the Portuguese Navy, at 7.0 a.m. The machine reached Las Palmas, Canary Isles, at 3.0 p.m., having covered 710 miles in 8 hours. The crew propose to rest at Las Palmas for a day or two, and then proceed to Praia (Cape Verde Islands), a distance of some 800 miles. The next stage is to Fernando Noronha, an island off the Brazil coast, and is of a length of 1,260 miles. Thereafter the coast of Brazil is only 250 miles, though it is proposed to fly down the coast to Rio de Janeiro.

The Fairey carries a total of 18 hours' fuel, and given reasonably good weather conditions is easily capable of the trip. Very accurate navigation will be needed on the long stage to pick up the objective, Fernando Noronha, and if it is missed by passing to south and east, the coast of the mainland may also be missed altogether.

Capitao Tenente Saccadura Cabral is a pilot of skill and experience, and has successfully navigated an F.5 flying-boat from Calshot to Lisbon, and from Lisbon to Madeira.

Capitao Coutinho is not so well known in this country. He appears to be a navigating expert, and to have been responsible for navigation during the Lisbon-Madeira flight, and his success on this occasion in reaching Las Palmas in so short a time seems to indicate that he is by no means inexperienced at his business.





# COMMERCIAL AERONAUTICS

## AND CIVIL AERIAL TRANSPORT.



THE UNITED KINGDOM OF GREAT BRITAIN AND IRELAND.

### CONTINENTAL ARRIVALS AND DEPARTURES.

[The following table of arrivals at and departures from the British Air Ports is compiled on the following system:— First comes the initials of the Air Line; next the type of machine; next the international number of the machine; next the ports of departure and destination; next the times of departure and arrival; next the cargo, whether goods (G) and/or mails (M); next the number of passengers; and finally the name of the pilot and number of mechanics, if any.]

The London Terminal Aerodrome, Croydon. (Telephone: Croydon 2720.)

#### MARCH 27th:

H.P., HP, G-EATH, London-Paris, 12.15-14.45, G.M., 1, Wilcockson & 1.  
M.A., Goliath, F-ADAY, London-Paris, 12.26-14.55, G., Nil, Le Sec & 1.  
G.E., Goliath, F-GEAO, London-Paris, 12.26-14.46, G., 5, Chalmers & 1.  
I.L., DH18, G-EAWW, London-Paris, 12.31-14.46, G.M., 2, Roberts & 1.  
G.E., Goliath, F-GEAD, Paris-London, 11.45-15.05, G., 7, Gastoux & 1.  
M.A., Brequet, F-CMAK, Paris-London, 11.46-16.16, Nil, 3, Delage.  
M.A., Spad, F-ACME, Paris-London, 11.45-16.29, Nil, 4, Paille.  
I.L., Vimy, G-EASI, Paris-London, 11.28-16.47, G., 3, Brady.  
I.L., DH4, G-EAMU, Paris-London, 11.35-16.05, Nil, 2, Barnard.  
M.A., Brequet, F-CMAH, Paris-London, 11.42-17.34, G.M., Nil, Rouge.  
H.P., HP, G-EATH, Paris-London, 16.06-18.35, Nil, Wilcockson & 1.

#### MARCH 28th:

G.E., Goliath, F-GEAD, London-Paris, 14.25-17.10, G., 5, Gastoux & 1.  
M.A., Brequet, F-CMAK, London-Paris, 14.26-17.08, G., Nil, Delage.  
M.A., Goliath, F-ADEA, Ldn-Paris, 14.31-17.30, G., Nil, Charpentier & 1.  
I.L., Vimy, G-EASI, London-Paris, 14.41-17.32, G.M., Nil, Brady.  
G.E., Goliath, F-ADDT, Paris-London, 14.08-17.07, G., 6, Mire & 1.  
H.P., Bristol, G-EAWY, Paris-London, 14.09-17.00, G., 3, McIntosh & 1.  
I.L., D.H.18, G-EAWW, Paris-London, 14.09-16.53, G., Nil, Roberts.  
M.A., Brequet, F-CMAF, Paris-London, 14.20-17.34, G.M., Nil, Donchin.  
M.A., Spad, F-ADBJ, Paris-London, 15.09-19.24, Nil, 4, Revenue.

#### MARCH 29th:

G.E., Goliath, F-ADDT, London-Paris, 12.05-14.40, G., Nil, Mire & 1.  
H.P., HP, G-EATH, London-Paris, 12.15-14.55, G.M., 3, Oley & 1.  
M.A., Spad, F-ACME, London-Paris, 12.27-14.47, Nil, 2, Mille.  
M.A., Brequet, F-CMAH, London-Paris, 12.28-14.45, G., Nil, Rouge.  
I.L., DH18, G-EAWW, London-Paris, 12.31-14.39, G.M., 3, Roberts.  
G.E., Goliath, F-GEAO, Paris-London, 11.46-16.39, G., 6, Favreau & 1.  
I.L., Vimy, G-EASI, Paris-London, 11.35-15.06, G., 4, Brady.  
M.A., Spad, F-ACMI, Paris-London, 11.39-16.45, G.M., 2, Robyn.

#### MARCH 30th:

G.E., Goliath, F-GEAO, London-Paris, 11.54-14.12, G., 2, Favreau & 1.  
H.P., DH4, G-EAWH, London-Paris, 12.21-14.39, Nil, 2, Wilcockson.  
I.L., Vimy, G-EASI, London-Paris, 12.22-14.47, G.M., 2, Brady.  
M.A., Brequet, F-CMAF, Paris-London, 12.37-15.14, G., Nil, Donchin.  
M.A., Spad, F-ADBJ, London-Paris, 12.47-15.12, G., Nil, Revenue.  
H.P., Bristol, G-EAWY, London-Paris, 12.48-15.26, Nil, 7, McIntosh & 1.  
G.E., Goliath, F-GEAD, Paris-London, 11.45-15.20, G., 4, Gastoux & 1.  
H.P., HP, G-EATH, Paris-London, 11.56-17.45, G., 3, Oley & 1.  
I.L., DH18, G-EAWW, Paris-London, 12.00-14.56, G., Nil, Roberts.  
M.A., Brequet, F-CMAL, Paris-London, 11.00-16.35, G.M., Nil, Portal.

#### MARCH 31st:

G.E., Goliath, F-GEAD, London-Paris, 12.26-15.26, G., Nil, Gastoux & 1.  
M.A., Spad, F-ACMI, London-Paris, 12.48-15-12, G., Nil, Robyn.  
I.L., DH18, G-EAWW, London-Paris, 12.34-15.53, G.M., 3, Shaw & 1.  
H.P., HP, G-EATH, London-Paris, 13.28-15.17, G.M., 6, Rogers & 1.  
H.P., Bristol, G-EAWY, Paris-London, 14.07-17.12, G., 2, McIntosh & 1.  
I.L., DH4, G-EAWH, Paris-London, 14.37-16.59, Nil, Nil, Wilcockson.  
I.L., Vimy, G-EAWH, Paris-London, 14.40-17.51, G., 2, Brady & 1.  
G.E., Goliath, F-GEAO, Paris-London, 14.47-17.49, G., 5, Chalmers & 1.

### The London Terminal Aerodrome.

Messrs. Stocken and Piercy have been up testing Martinsydes, Bristol, Avros, and D.H.9s during the week. Mr. Stocken started off to St. Ingelvert on Thursday on an Avro, but owing to a variety of circumstances he returned and went off again the following day.

Mr. and Mrs. Courtney left for Brussels on a D.H.9 on Saturday and returned early Sunday morning.

The Aircraft Disposal Company are getting busy with the "Dark Horse" for the Easter Monday races. Mr. Muir will be its pilot and Mr. Stocken will fly the D.H.9. There

ABBREVIATIONS:—A.D.—Aircraft Disposal Co. B.A.—Berkshire Aviation Co. B.C.—Bristol Aeroplane Co. C.A.—Department of Civil Aviation. D.A.—Daimler Airway. D.H.—De Havilland Aircraft Co. G.E.—Compagnie des Grands Express Aeriens. H.P.—Handley Page Transport Ltd. I.L.—Instone Air Line. K.L.—Koninklijke Luchtvaart Maatschappij. L.A.—Leatherhead Aviation Services. M.A.—Messageries Aeriennes. M.W.—Marconi Wireless Telegraph Co. Ltd. P.O.—Privately owned. P.L.—Peters Ltd. S.F.—Surrey Flying Services. S.N.—Syndicat National pour l'Etude des Transports Aeriens (S.N.E.T.A.).

#### APRIL 1st:

I.L., DH18, G-EAWW, London-Paris, 13.32-15.56, Nil, 6, Shepperson.  
H.P., DH18, G-EAWW, London-Paris, 13.33-16.03, M., 6, Oley.  
H.P., Bristol, G-EAWY, London-Paris, 13.37-16.02, Nil, 7, McIntosh & 1.  
G.E., Goliath, F-GEAO, London-Paris, 13.52-16.34, G., 6, Chalmers & 1.  
M.A., Brequet, F-CMAL, London-Paris, 14.02-17, G., Nil, Portal.  
H.P., HP, G-EATH, Paris-London, 12.30-15.47, G., 2, Rogers & 1.  
I.L., DH18, G-EAWW, Paris-London, 12.40-15.18, G., 2, Shaw.

#### APRIL 2nd:

D.A., DH34, G-EBBK, London-Paris, 10.07-13.25, G., Nil, Hinchliffe.  
I.L., DH34, G-EBBK, London-Paris, 11.04-13.30, Nil, 8, Barnard.  
I.L., DH4, G-EAMU, London-Paris, 11.15-13.27, Nil, 2, Wilcockson.  
I.L., DH4, G-EAMU, London-Paris, 11.36-13.45, Nil, 2, Courtney.  
I.L., Vimy, G-EASI, London-Paris, 12.17-15.16, G., 3, Brady.  
H.P., DH18, G-EAWW, Paris-London, 11.50-14.04, Nil, 1, Oley.  
I.L., DH18, G-EAWW, Paris, London, 11.55-14.02, Nil, 8, Shepperson.  
M.A., Goliath, F-ADAY, Paris-London, 13.20-16.05, Nil, 8, Le Sec & 1.  
H.P., DH4, G-EAWH, Paris-London, 14.50-16.48, Nil, Nil, Wilcockson.  
I.L., DH4, G-EAMU, Paris-London, 16.20-18.20, Nil, 2, Courtney.  
I.L., DH34, G-EBBK, Paris-London, 16.22-19.51, Nil, 8, Barnard.

### Inland Flying at Croydon.

March 27th and 28th—Nil.  
March 29th—H.P., D.H.18, (tests (Rogers); S.F., Avro, joy-rides (Muir); P.O., Avro, test (Pudney).  
March 30th—I.L., D.H.18 and D.H.4, tests (Jones and Shepperson); P.O., Avro, test (Muir).  
March 31st—H.P., H.P., test (Oley), D.H.18, test (Rogers); D.A., D.H.34, from Stag Lane and tests (Hinchliffe, Hume, Duke, Robertson and Robinson).  
April 1st—D.A., D.H.34, tests (Payne); I.L., D.H.18, test (Barnard); R.A.C., Avro (Charlton); Avro (Fogarty); D.H.34, from Stag Lane return (Cobham); I.L., D.H.4, from Stag Lane (Barnard); S.F., Avro, joy-rides (Muir); L.A., Avro, Leatherhead return (Wood), R.A.C., Avro (Charlton and Vincent); R.E.C. (Vincent).

### Flying by the Aircraft Disposal Co.

March 27th—Martinsyde F.4, test (Stocken); Martinsyde F.4, test (Stocken); Avro, test (Stocken).  
March 28th—Nil.  
March 29th—Avro, test (Piercy); Martinsyde F.4, test (Piercy); D.H.9, test (Piercy); Bristol Fighter, M-MRKR, test (Piercy).  
March 30th—Bristol Fighter, M-MRKR, left for St. Ingelvert (Stocken).  
March 31st—Nil.  
April 1st—D.H.9, left for Brussels (Courtney).

### Cross-Channel Statistics.

Week ending April 2nd—  
Machines, 66; Passengers, 177; Crews, 105; Total Personnel, 282  
Corresponding week last year:—  
Machines, 48; Passengers, 162; Crews, 60; Total Personnel, 212

will also be two Martinsydes entered by the firm but the pilots are not yet fixed.

The Air Lines had a fairly good week of it and the passengers are now beginning to appear in bulk.

The event of the week was the arrival of the D.H.34 on Friday for the Daimler Airway. The machine is painted pillar-box red all over, including the wings, and one could not help thinking how much its appearance would be improved if the windows and doors were outlined in black and also the sides of the fuselage and the edges of the planes.

Mr. Hinchliffe brought her over on Friday morning and

## Royal Mail.

INSTONE AIR LINE, Ltd.,

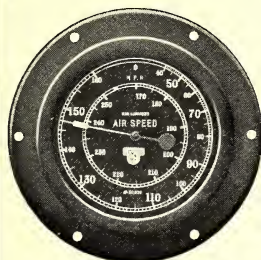
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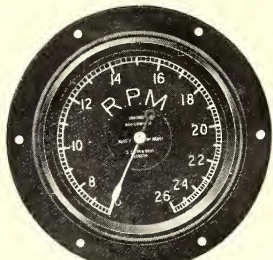
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The lightning-like quickness of Carpentier's second winning punch, as Cook was falling, raised no doubt as to whether it was delivered before or after Cook actually reached the ground. In high-speed movement the human eye is very liable to be deceived. It is especially untrustworthy as to whether quick movements are synchronous or dissynchronous, and in deciding at successive points of time the relative positions of unlinked mechanisms. The eye of the Cinema Camera is under no such disability and produces a perfect record of time and position of all it gathers in. Here the decision was of the most vital importance—foul or no foul? Carpentier or Cook? The Referee fortunately was right, and the Cinema pictures prove, to those who thought otherwise, by exactly how much he was right.

Probably the great value of the accuracy of the Cinema record has never before been so prominently brought to the knowledge of the public; but from the beginning of 1915 its accuracy has been utilised in the study of the successive developments of

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thereafter the other Daimler pilots, Messrs. Duke, Herne, Robinson and Robertson, each took her up into the air for tests. All of them liked the machine and found her easy to land.

On Saturday morning Mr. Payne, the Air Ministry's test pilot, took her out for her type tests and made some exceedingly pretty landings. It seems that Mr. Payne is now getting the better of the "Hoo-doo" who usually assists(?) him to land at Croydon. The D.H.34 was found to carry her full load exceedingly well and doubtless as soon as pilots get to know her she will do all that is expected of her.

Earlier in the week Messrs. Shepperson and O. P. Jones did their preliminary tests on the Instone D.H.4 and 18. Both of them seemed to like the D.H.18 very much.

On Saturday Mr. Shepperson made his first trip as an Instone pilot to Paris on the D.H.18. He landed her very well and brought her back the following day and made a very nice landing at Croydon.

Mr. Rogers made his first efforts on the Handley Page Transport D.H.18 early in the week. He made half a dozen landings, each of which was carried out as though he had flown a hundred hours on the machine. Mr. Olley has also been flying the machine and took it to Paris on Saturday, returning on the Sunday.

The new W.8s with Rolls-Royce engines are nearly completed at Cicklewood and will be out on and on the service very shortly.

On Saturday Mr. Charlton, an R.A.F. cadet, came down to take his R.Ae.C. ticket observed by Mr. Stevenson. He made a flight in spite of a very high wind that was blowing. Mr. Stevenson thought it advisable to postpone the "ticket" tests until a calmer day.

At 10.30 hrs. Major Foot and oneself started off on a Club Avro to see the boat race. We got into thick mist and came out into comparatively clear weather right over Putney Bridge, where we could see the two crews in the centre of the river waiting to start. Cambridge gained a clear length over the start itself and thence the whole way round the course they gradually gained. At Mortlake we saw the eagle eye of Mr. Harold Perrin watching us. He looked so funny with one eye on us and the other on the boats!!!

There is any amount of forced landing grounds in the bend of the river, and, though we never came below 2,000 feet, a landing could be made practically anywhere in the neighbourhood of the course from 200 feet or so. It is certainly an ideal way to see the race, as one can follow it the whole way along and at the same time it only occupied half an hour of one's time including the going and coming instead of a whole afternoon and there is no inconvenience from crowds.

#### A BUSY SUNDAY.

On Sunday Mr. Vincent was flying the Club B.F.2c and the Avro and Mr. Charlton was once more up on the Avro.

The Daimler D.H.34 was due to start from Paris at 05.30 hrs. on Sunday morning carrying copies of a Sunday paper. Unfortunately, owing to certain difficulties it did not get away until 10.07 hrs., and it seemed to have a certain difficulty in taking off with its colossal load of papers, which weighed very nearly a ton. When it got to Paris it landed on some soft ground and stuck fast.

The Instone Line had invited the editors of various daily papers to fly to Paris and partake of food and drink and return the same evening in their new D.H.34 on Sunday. The invitation was of some weeks' standing as the machine was expected to have been delivered a fortnight previously. However, owing to timber trouble etc., the machine had been delayed considerably and it was expected at 13.00 hrs. on Saturday. It never arrived and the I.A.L. were informed that it would reach Croydon at 18.00 hrs. that evening.

Further delays, however, prevented its delivery on Saturday evening and Mr. Barnard went over to Stag Lane to collect it early on Sunday morning. At 08.30 hrs. it was ready and Mr. Cobham took it up on its test flight, which proved quite satisfactory. He then left for Croydon with the machine accompanied by Mr. Barnard, who brought over a D.H.9c for Mr. Cobham's return.

On arrival at Croydon Mr. Barnard took the machine for a short test and then embarked the ten Press representatives. He went down to the Flook Lane corner of the aerodrome near the train lines and started his run. When three-quarters of the way across the aerodrome the machine showed no signs of lifting and so Mr. Barnard switched off and taxied back to the Customs and shed two passengers, who were later taken across by Mr. Courtney on the D.H.4. Relieved of the two passengers the machine took off easily, climbed well, and made good time to Paris. She returned later in the day, landing at Lympe on the way back to remedy some oil trouble and finally making Croydon at 20.00 hrs.

To have had her first test flight at 08.30 hrs. and then the same day to make a return trip to Paris is a very fine performance and speaks volumes for De Havilland design and Mr. Barnard's skill and determination as pilot. The feat is all the more remarkable when one considers that owing to pressure of work on the machine Mr. Barnard only had two hours' sleep on the Saturday night.

It may be remembered that in the early days of the D.H.18, which was flying some six weeks or more before it was finally passed for service, some difficulty was experienced in making the machine lift its full load, and the late lamented A.T. and T. used to prefer to fly the machine with only six passengers at first. Now the D.H.18 takes off with eight passengers and goods with the greatest of ease and one has no hesitation in saying that when the D.H.34 has been properly tested and when the riggers get to know their tricks, she will easily lift her full load of ten passengers with a big surplus weight of luggage in addition. Anyway, one offers one's best congratulations to Mr. Barnard on putting up an exceedingly fine performance.

The "Vimy" went off at midday with a load of paying passengers on her schedule trip, piloted by Mr. Brady. Mr. O. P. Jones occupied the spare pilot's seat. Mr. Shepperson returned on the 18 on Sunday afternoon.

The I.A.L. foremen are all arrayed in uniforms now and the mechanics have uniform caps with the house badges on them.

The R.Ae. Club machines were used on Friday in connection with a cinema stunt. Their engines were run full out whilst the aerodrome fire hose was played on the slip team. The heroes of the piece walked through this and carried out their professional antics while the camera man worked his machine. This on the film will represent a torrential down-pour in a gale of wind.

Sir F. H. and Lady Sykes visited the aerodrome on Sunday and Lady Sykes christened the new D.H.34 with a bottle of champagne.

It is suggested at Croydon that Major Foot would make a very fine successor to the C.G.C.A., with Mr. Larry Carter as his second in command.

Handley Page Transport Ltd. have won the competition for putting up signs on the aerodrome and the words "Handley Page Transport" are now written on a board above their offices in letters about ten feet high. They can be read for miles round as they stand up above everything else, and moreover at night they just catch the revolving beam of the search-light.

Mr. Handley Page was at the aerodrome on Saturday and people in the Trust House gathered that he had been playing golf.—G. D.

#### Stag Lane.

On Wednesday a number of visitors came to the De Havilland aerodrome to inspect the D.H.34. Just before they came, Mr. Herne took the air on a D.H.6 and flew round for a few minutes.

Mr. Cobham then proceeded to take the visitors for joyrides in the D.H.34, taking nine passengers on each occasion.

Personally, one had the pleasure of a flight together with such distinguished company as the general manager of the Daimler Airway, Mr. Hazell-Jones (of D. Napier and Son), and Mr. R. A. Loader (of the Leparia Travel Bureau). The machine is exceedingly comfortable, and the engine noise is reduced to such an extent that conversation can be carried on without an effort. The machine pulls up very quickly on landing.

Incidentally it is interesting to note that Mr. Cobham was the first pilot to take the machine into the air on her first tests.

On Friday morning Mr. Hinebliffe and Mr. Herne left for Croydon on the Daimler Airway's D.H.34.

On Sunday morning the D.H.34 for the Instone Air Line was completed and given a short test, after which Mr. Cobham left for Croydon on the machine, accompanied by Mr. F. L. Barnard on Mr. Cobham's D.H.9c. Mr. Cobham returned to Stag Lane on this later in the morning, and left for Croydon again in the evening with the intention of bringing the D.H.34 back to Stag Lane for completion. That machine, however, arrived back at Croydon from Paris too late in the evening, so Mr. Cobham, the 9c, and the 34 spent the night at Croydon.—G. D.

#### THE DAIMLER LUNCHEON.

The joint lunch given by the Handley Page and the Instone Air Lines on Tuesday, March 28th, to celebrate the past year's work on the London-Paris service (reported in THE AEROPLANE of last week), was followed upon the next day by a somewhat similar function, given by the directors of Daimler Hire Ltd., to celebrate their imminent embarkation on the adventure of running yet a third British air line between the same two capitals. The scene of the operation was the Criterion. Mr. E. J. Manville, M.P., chairman of the Daimler Company, occupied the chair, and Capt. the Hon. F. E. Guesard, C.B.E., D.S.O., M.P., Secretary of State for Air, was the guest of honour.

After lunch the Chairman, proposing the health of the Secretary for Air, explained that Daimler Hire Ltd., after a long and successful experience of land transport organisation, had a natural ambition to extend their activities to the air. This ambition was strengthened by the fact that their organisation under Col. Searle had managed the pioneer service run by



the late Air Transport and Travel Ltd. for one year, and in that year had achieved a technical, if not a commercial, success.

Commercial success was a matter of organisation, of using one's plant to the fullest possible extent, and they believed that it would be possible by such organisation to operate without calling for a subsidy—providing foreign competitors did not cut prices further.

Captain GUEST welcomed the advent of a third operating company, particularly as it had already shown its great organising capacity. He particularly welcomed it as being the first such concern to indicate that it hoped to dispense with a subsidy—a suggestion which would commend itself to the Treasury.

He had been accused of pessimism, he thought unfairly. Outside Britain there were great stretches unbridgeable except in the air, and he regarded the work so far done as only a demonstration of the value of air transport to these extra-British but Inter-Imperial services. Some openings were now ready. The Air Ministry was ready to listen to suggestions to operate the desert route to Baghdad, and there would be other opportunities in the future.

The position of the Air Ministry had recently been greatly strengthened. They could now deal with their responsibilities for defence on a footing equal to that of the older Services, and he hoped that would allow them to deal more freely with Civil aviation in the future. It was not true to suggest that Civil aviation had been snowed under by Military preconceptions, and it would not be while he was responsible. But the Air Ministry had for the past few years been charged with the formation of a new force vital to the national security, and it had been their first duty to see to that work, which had overburdened their resources. Public opinion must be educated if the Air Ministry were to do more than they now did. Public opinion and public demand were the only weapons which would move the House of Commons, and so provide them with the required funds.

Mr. F. G. KILLAWAY (Postmaster-General) said that the audacity of the Daimler Hire project commended itself to him; for audacity and enterprise were qualities greatly needed at present. Until he had assumed his present position he had been a politician pure and simple—so far as any politician could be pure and simple—but he had now taken on some of the qualities of a business man. He could say to the air companies that his goods were at their disposal if their terms were satisfactory. Speed, cheapness and reliability were the requisites, with reliability as the primary necessity. In this respect the air services had improved greatly and the outlook was much brighter than it had been. So far as London-Paris was concerned, he could offer them plenty of mail when they could run reliable night services. Despite the Post Office endeavours, the business man would not post his Paris letters till the evening, and those letters could reach Paris next morning with present arrangements. Unless they flew at night he could not give them those letters.

The outstanding achievement in air mail work was the Cairo-Baghdad service. Letters by this route took 10 days against 27 by the ordinary route, and the time was he believed to be reduced to 8 days. Forty-five per cent. of all Baghdad mails now went by air. This was the greatest advance in mail service ever yet achieved.

Colonel FRANK SEAWLE said the Daimler Hire business had been built up on the principles: service to the public, and value for money. They proposed to apply the same principles to their new venture. He had been criticised because he was sacrificing one seat in his machines to a steward to attend to the comfort of passengers. He would like to point out that Daimler cars could carry more passengers and would cost less to run if they made the passengers stand up, and he was certain that even in air lines attention to comfort was going to pay. He liked the Postmaster-General's appreciation of their audacity, but thought it would be a good thing if the Post Office would show a little audacity of their own. Commercial aviation was at present a very young child and needed food. The Post Office had the food but their attitude seemed to be that they did not think it their business to do the feeding until the child had grown up.

He was pretty certain that he could run at a profit if fares had remained at their original level without any subsidy. He was not quite sure now, but at the end of 12 months' running he would be in a position to give the Air Ministry accurate figures as to what they could do.

Finally, he wished to thank their engine makers, D. Napier and Sons, for the very great assistance they had given to the enterprise by doing everything possible to provide a satisfactory engine for their work.

He must also express his thanks to Capt. de Havilland, the designer of their aircraft, who had been most receptive to all the practical transport suggestions put to him. He thought it should be emphasised to his credit that Capt. de Havilland was he believed the only designer of commercial aeroplanes who himself flew the machines he designed.

## PERSONAL NOTICES.

DEATH.

BRAGG, WREN.—At Spillgate, Lincs, on March 28th, as the result of a flying accident, F/O. Charles Willie Bragg and AC. W. Wren, both of 39 Sqdn., R.A.F. The machine, a D.H.6a, appears to have crashed when taking off.

MARRIAGES.

CONINGSBY—SHAW.—The marriage recently took place at Durban of Maj. H. R. Coningsby, M.L.A.E., M.L.A.C.E., late Middlesex Regt. and R.F.C., and Edith, daughter of Mr. and Mrs. E. Shaw, of Johannesburg.

STROUD—WOODCATE.—On Jan. 31st, at St. Thomas' Cathedral, Bombay, F/O. G. J. Stroud, M.B.E., R.A.F., to Janet May, only daughter of Mr. and Mrs. Edwin Earl Woodcote, of High Halden, Kent.

BIRTHS.

ELIOT-KING.—On Jan. 8th, "The Gables," New Plymouth, New Zealand, to the wife of Capt. Eliot-King (late R.A.F.)—a son.

JENYNS.—On March 30th, at 25, Cambridge Mansions, Battersea, to Dorothy, wife of R. Fitzgerald Jenyns (late R.F.C. and R.A.F.—a daughter).

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Fairley Aviation Co. Ltd., The, Hayes, Middlesex "Airly," Hayes, Middlesex. Hayes, Middlesex 19	230
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Short Brothers (Rochester & Bedford), Ltd., Scaplane Works, Rochester, Kent "Scaplanes," Rochester. Chatham 62	Inside Back Cover
Supermarine Aviation Works, Ltd., The, Southampton. "Supermarine," Southampton. Whistler 37 (2 lines)	Inside Back Cover
Vickers, Ltd., Vickers House, Broadway, London, S.W.1.	
"Vickers," Vic, London. Victoria 6000	241
Westland Aircraft Works, Yeovil. "Aircraft," 141 Yeovil.	242
Yeovil 141	

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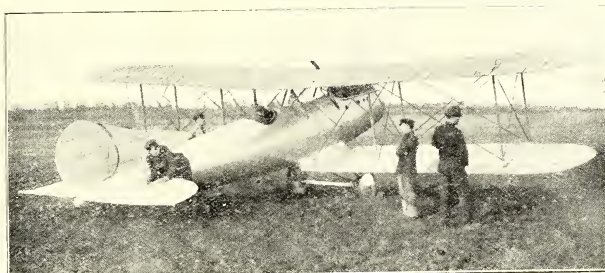
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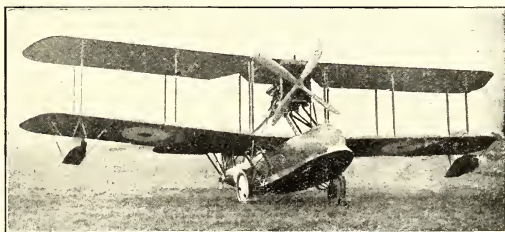
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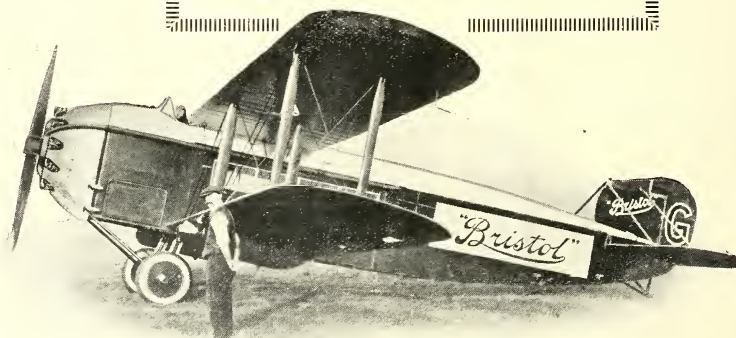
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## THE R.A.F. CREED.

On Tuesday, April 4th, the Royal Air Force Staff College at Andover, commanded by Air Commodore H. R. M. Brooke-Popham, C.B., C.M.G., D.S.O., A.F.C., was officially opened. The ceremony was to have been performed by Air Marshal Sir H. M. Trenchard, Bart., K.C.B., D.S.O., A.D.C., Chief of the Air Staff, but owing to urgent official duties he could not be present. Therefore Air-Vice-Marshal Sir J. M. Salmon, K.C.B., C.M.G., C.V.O., D.S.O., A.O.C. Inland Area, acted as his deputy and read the inaugural address on behalf of the Chief of the Air Staff.

This address, specifically made to the Staff and pupils of the College, is far from being limited in its application to this particular circle. It may be regarded as a statement of the whole duty of the Royal Air Force and its general teachings are such as should be taken to heart by every officer and man of that Force.

That address is therefore hereafter reproduced almost in its entirety, and without the omission of any of the many important points which it emphasises. The Royal Air Force has but to live up to the creed which has here been laid down for it to ensure that it shall be worthy of the burdens which the future will inevitably lay upon its shoulders.

### SIR HUGH TRENCHARD'S ADDRESS.

Sir Hugh said: "For the Royal Air Force it is indeed a great day; and those who look back on the formation of the Central Flying School, at the work of the Air Service as a whole since the Great War, and remember the necessity for the efficient and economical defence of this great Empire, will understand how great a day it is when we open our Staff College, the cradle, as I may call it, of our brain.

We must look upon ourselves now not only as one of the servants but also as one of the custodians of the British Empire. Our relations with the older Services have now been defined in the House of Commons for all to read. The integrity of the Air Service is assured, and though our relations with the Navy are still under discussion I want all officers and men to realise how much the two older Services want to help us. We must put aside from our minds any idea that we are omnipotent and that we, and we alone, are the people that cannot be argued with. For practical purposes of the defence of the Empire the three Services are really one Service, and all of you must realise that whatever happens, whatever discussions arise, it is all three that will defend this Empire.

There is one thing that I want to say first, and that is that I hope all instructors and officers here will observe the strictest secrecy as to the important confidential matters of policy that it will be your business to discuss and debate. In the past the confidence reposed in the older Colleges like Camberley has, I believe, never been abused. It is for every one of you to remember that the honour of the College is in your keeping. In the course of your studies it will be necessary for you to become acquainted with the operations carried out by the Air, with the success of such operations and how they should be conducted, and, possibly, with the non-success of such operations and how they should not be conducted. In addition you will have put before you arguments for and against different schools of thought between the Services. I repeat, never abuse this confidence and never allow confidential or secret matters to escape.

### ECONOMY.

Many officers will pass through this College, and in the future from their brains, I hope, will emanate new and brilliant ideas for the development of the Air and its power. Remember that the one great thing to which you should at all times apply your thoughts and brains is the expansion of the power of material and personnel without increasing either. That way lies economy. Do not always be biased in favour of development of Air at the expense of the other Services. What you have to weigh and weigh carefully is the balance between cost and efficiency. If efficiency is equal in each case, which is the more economical? Nothing else.

In my opinion, and it is the only possible opinion, no officer who aspires to a high position on the Staff or in command can exercise to the full his powers and capabilities if he does not study economy and the power of money to provide what is required. I very often hear of officers saying "My Squadron is

more efficient than So-and-So's Squadron," but seldom did I in the old days hear of an officer saying: "My Squadron is as efficient as So-and-So's Squadron, but I run mine at half the cost in petrol and tyres and machines." It is from that point of view that I want every officer to approach the question, to procure a maximum of efficiency at a minimum of cost. Though your paintwork, your roads and your gardens and everything else may look very much nicer than everybody else's, ask yourselves does it cost less than anybody else's station. Your pilots may fly in better formation than anyone else's pilots. Ask yourself are you running them at a less cost than anybody else. I do not want you to think that efficiency is not still an important factor, but I do want you to have it constantly in mind that economy is as great a factor.

It is not generally understood by officers that the reason why it is not possible to order more new type aeroplanes and engines is owing to the enormous amount of money which has now to be devoted to the purchase of spare parts and stores. In war time or on active service the problem is slightly different. The economical use of spares and stores is then of value, not so much from the monetary point of view as in those involving the difficulties of transport. In addition to the important problem of the economical use of stores, the Commander and staff of any unit on active service must devote themselves to obtaining the maximum results with the material at their disposal, and improvise where necessary, rather than cry out for more stores. It is the man who can make bricks without straw who will make a success of any Air Force expedition in uncivilised countries.

### AIR POWER.

Now I want to touch upon the development of the Air, not in substitution for other forms of defence, but to meet new forms of attack, which is really the vital question. I want you to discuss and consider whether the new forms of attack have not brought about such changes in the situation that the question will have to be seriously considered whether it is possible for fleets and armies to work if the command of the Air is not assured first, in the same way as hitherto it has been accepted that armies cannot move across the sea unless we have command of the sea. I do not want you to pre-judge this question; it must really be carefully studied and investigated. In this connection I hope it may be possible to get Naval and Military Officers to come and give their views on this subject, so that it may be studied as a whole and not in watertight compartments.

I now come to another matter to which it is necessary for you to apply yourselves, the Air as an auxiliary to the Army and Navy. The first principle is to remember that what may be called the subsidiary rôle is vital also to the defence of the Empire, and the older Services will naturally and rightly feel very much concerned if their efficiency suffers by not having the knowledge, the training, and the material and personnel as efficient and numerous as is necessary to enable the Navy to carry out their particular rôle on the high seas, and to enable the Army successfully to carry out its functions on land. In this connection I must again say that the two older Services wish, as I know, only to help us, and that they look with a single eye to the defence of the Empire as a whole. In the same way as we know they would help us to solve our problems, so we on our side must do our utmost to help them in solving theirs.

### RESERVES.

The next matter is our Reserves. We are a very highly scientific Service. The men must be of the best, and are of the most highly skilled trades, and the pilots are of a very highly skilled type also. It is impossible in peace to maintain a force big enough for any eventualities, nor should it be necessary. Therefore we have three types of Reserve: the first the people who pass out of the Air Force into the Regular Reserve; secondly a form of Auxiliary Air Force, acting as the Territorial Force does towards the Army; and I foresee that this will be a most important force for the defence of these islands in time to come. By its means I hope that the knowledge of aviation will spread to our civil population. Thirdly, we must look to the civil aviation that is developing or may be developed in the future for a Reserve.

If a large number of machines and pilots can do useful commercial work in their civil capacity they will be of inestimable value as a Reserve for war.

Yet another point. I refer to the co-operation that must always be maintained between the Civil Service, including that great branch Finance, and the fighting Services. Many years ago I heard the phrase used "Blackcoat versus Red Coat." This is not so, and we must not look upon it like that. All the servants of the Crown, Civil, Naval, Military and Air are, besides the ordinary work of the government of the country, constantly at work in preparing for the defence of the Empire, and we could no more do without the Civil Service than the Civil Service could do without the fighting Services. Therefore I ask you, and I am talking from what I know, to realise that the Civil Servant is just as keen as you are to defend the Empire and to do it economically and efficiently. You cannot get the best results if you do not bring that into your calculations.

#### STAFF RESPONSIBILITIES.

I now turn to matters of a less general character. One is that I want you to remember that the work of the Staff and Commanders of the future is to plan how the personnel shall kill the enemy, and, I fear, very often get killed themselves. I do not want you to allow this unduly to weaken your decisions, but I do want you always to bear in mind your responsibilities. You must keep in mind that operators will bring about casualties and be sure that these operations will be commensurate with the loss involved.

This is a great responsibility, but it can be borne with ease if you keep a due sense of proportion and never lose an opportunity of taking part in the actual fighting when your turn of staff work is over.

Another point I would ask instructors to bear in mind is one of no little importance. Pupils should be encouraged by every means to practise the ability to express themselves clearly and concisely both on paper and in conversation. The habit of debate should be fostered in order to acquire the habit of clearly and concisely stating a case. In my early days no such opportunities occurred, and at various meetings now I sometimes feel a difficulty in doing justice to ideas that in themselves merit the clearest and most concise exposition.

### ON THE AIR-LINE COLLISION.

On Thursday, April 7th, at about 12.00 hours, the D.H.18 loaned to the new Daimler Airway company, flying from London to Paris, piloted by Mr. Robin Duke, collided at a height of about 400 feet with a "Goliath" Farman of the Grands Express Aériens flying from Paris to London, piloted by M. Jean Mire, over Thienloy-St. Anthoine, a village some 18 miles north of Beauvais. Mr. Duke had with him as his only passenger a youth named Hesterman who was employed as a steward on the line. M. Mire's passengers were Gabriel Simonet (his engineer-mechanic), M. Bonriez (chief engineer of the Grands Express Aériens), and Mr. and Mrs. Christopher Bruce, who had recently arrived in Paris from the United States.

Local reports say that the machines were flying in heavy mist and collided head on. All on board were killed instantly, with the exception of Mr. Duke who was seriously injured and died the next day.

The French papers naturally place the blame on Mr. Duke, alleging that there is a rule that aircraft bound for London shall fly to the East and North of a certain route, and that aircraft bound for Paris shall fly to the West and South of that route. According to these allegations M. Mire was on his correct course whereas Mr. Duke was off to the East.

It is true that the rule of the air is "keep to the right," but there is certainly no international regulation as to the course to be followed between London and Paris. Therefore the aforementioned allegations may be taken merely as an example of the modern French custom, which is "in any case blame the English."

#### The Circumstances of the Accident.

The fact of the matter evidently is that M. Mire and Mr. Duke, both of whom had many years of experience of flying with many types of aeroplanes in all kinds of weather, were for lack of any better guide following the main road between Beauvais and Abbeville according to the custom of all pilots on the London-Paris route in thick weather. It seems fairly obvious that each was watching the road so carefully—which is very necessary over that particularly featureless stretch of country—that he failed to see the approach of the other machine till it was too late to avoid a collision.

The fact that the two machines should have been on the same level and at the same distance horizontally from the road is accounted for by the fact that both pilots would be naturally flying as high as they dared to fly without losing sight of the road, and as both had presumably first-class eyesight their respective distances from the road and from the ground would be the same.

Therefore no blame attaches to either pilot. Such an acci-

I feel it is vitally important that good and sound ideas shall not suffer and be rejected by reason of faulty expression.

Another matter I want to touch upon is this. There are two classes of Meetings of Senior Officers. In one class you have your conference of various advisers and you ask them to talk and argue; and you sit and listen and try to absorb all that is said on some particular matter. Then the meeting is broken up and you go away and try to think the subject out, and you finally make up your mind as to the best course. The other type of meeting is that in which your mind is already made up. You send for all the officers concerned and explain to them all the facts and arguments, and make them understand what their duties are and their responsibilities in the particular work that is being reviewed. This latter is one in which the man laying down the law must be very certain that he knows his subject, and that he speaks his mind in no uncertain language so that his staff and subordinate commanders go away imbued with the idea that he is right, that he knows his subject and his job, and that his plans if carried out will lead to success.

I want to touch before I sit down on what was said to me once by a very great commander, and that is that it is the duty of staff officers and senior officers to prevent difficulties and very often fifty per cent. of their work is to smooth matters over and prevent friction. I am not exaggerating, it is really my belief that half my work in the little sphere I have been working in has been to settle disagreements. Petty friction will always exist. Avoid it as much as possible and remember that because one man dislikes another there is no reason for these particular people each to try to foment what is just a personal antipathy between two individuals into two great cliques. I may dislike B, but no useful purpose will be served by his going to C and saying what an objectionable man is B. A can never, perhaps, be persuaded to like B, but if he will only keep his dislike to himself the friction will not be aggravated.

I have kept you some little time, Gentlemen, so I will bring my remarks to an end by saying that the setting up of the Staff College is a signpost, and on the signpost are the words: Efficiency, Economy, and Foresight.

dent was bound to happen sooner or later and the pity is that it did not happen sooner, for then we should have been that much nearer the proper control and organisation of air routes. This accident must be taken as a necessary evil. Just as collisions and fires at sea and on railways had to occur before the Board of Trade took proper steps to safeguard the lives of passengers and crews so such accidents as this must occur before the "competent authorities"—who are very evidently incompetent—can be roased to make adequate regulations for the proper operation of air lines.

#### The Responsible Parties.

The whole affair is a damning indictment of the utter unfitness for their positions of those in England and France who are supposed to be responsible for Civil Aviation. Over a year ago one pointed out in this paper with all possible emphasis the need for proper observation posts on the Beauvais Ridge and in the Somme Valley, with adequate wireless telephone communication to aircraft flying between Boulogne and Paris, so that pilots might be told whether it was safe to fly over the clouds or below them.

Even earlier than that Mr. Frank Courtney had been advocating the need for a proper set course for the London-Paris route. He had narrowly escaped a collision with another aeroplane which came suddenly out of a cloud over Boulogne, and he then pointed out that unless machines flying in opposite directions were compelled to keep to a certain definite route there would certainly be a collision. And now his prophecy has come true.

Before the end of the War we had thoroughly workable wireless telephones on our fighting machines, and we had directional wireless which made it possible to locate either sea or air craft to within a mile or so at a range of a hundred miles or more. Yet here three and a half years later we have a ghastly collision occurring for lack of a simple wireless organisation which could have been installed at the cost of a few thousand pounds.

Instead of that simple and cheap organisation we have seen the Department of Civil Aviation squandering hundreds of thousands of pounds on Sir Frederick Sykes' grandiose schemes for an air route to the East, with landing lights and a mooring mast in Egypt, a vast aerodrome in Malta, that absurd and obstructive mooring mast at Croydon, and so forth. As one pointed out in discussing the Air Estimates an excess of farsightedness may be more dangerous than the defect of being short-sighted.

Sir Frederick Sykes has resigned, and is therefore presumably no longer responsible for the sins of omission of what was his Department until seven days before this collision pro-



vided an appalling example of official incompetence. But that does not alter the fact that at intervals for a year or more this paper has constantly advocated the establishment of proper wireless control of the London-Paris air route. He and his subordinates have consistently ignored the warnings which they have received and now they see the awful consequences of their neglect.

#### An Inadequate Defence.

It may be pleaded in their defence that the British Department of Civil Aviation could not establish wireless stations in France, and that the French air line machines do not carry wireless apparatus. Such are the facts, but they do not decrease the blame which attaches to our Civil Aviation officials. They merely indicate that the French Civil Aviation people are even more criminally negligent than our own.

While the notorious Peace Conference was in progress we all read glowing eulogies of Sir Frederick Sykes' successes as a diplomatist in negotiating the International Air Convention and persuading various and assorted European States to conform to British ideas of controlling Civil Aviation. Surely it should not have been outside the capabilities of such a diplomat to persuade the French authorities of the prime necessity for adequate wireless communication with aircraft.

Even if the French air authorities refused to be convinced and refused to set up proper observation and control stations of their own, and even if they refused to allow the British Department of Civil Aviation to set up its own wireless stations on French territory, surely one who has shown himself so skilful in persuading those in high places of his own suitability for important positions during and since the War as Sir Frederick Sykes has done should have been sufficiently skilful to have got round the French official refusals even if he could not get over them.

For example, he might have devoted some of the Civil Aviation subsidy money to financing the building and equipping of wireless control and observation posts by the subsidised British air lines themselves. Being ordinary commercial concerns the French authorities would doubtless have permitted them to set up such stations of limited range and power. And if not, surely some other means might have been found of assuring by wireless the safety of British aircraft on the London-Paris route.

It would be very interesting to know whether Sir Frederick Sykes or his Department ever made any attempt to establish British observation and wireless control posts in France and if so what those attempts were and why they did not succeed. But whether such attempts were made or not it is painfully evident that he and his Department have failed lamentably in their prime reason for existence, which is to establish and make safe British Civil Aviation.

Their responsibility for the recent loss of life is all the greater in that they have been warned over and over again that particular steps should be taken to make the air route safe, and that they have consistently ignored those warnings.

#### French Responsibility.

So far as the French Civil Aviation authorities are concerned their responsibility is equally great. The administration of Civil Aviation in France would be a joke if it were not a tragedy.

French commercial aircraft carry no wireless, probably for the good reason that in many cases if they carried wireless their passenger-carrying capacity would become derisory: for most French commercial aeroplanes are merely transmogrified war machines, thanks to the absurd French subsidy system and Germanophobia. All civil aviation in France is subordinated to the Army, which naturally cares nothing for safety and efficiency in mere commercial flying, so long as plenty of aeroplanes are built and used.

At present *Le Matin* and other French journals are carrying on a strong campaign against the Army's control of aviation and are advocating the formation of a separate Air Ministry, as in Great Britain. It is generally understood that M. Flaudin, lately Under Secretary for Air in the French Government, is the moving spirit in this campaign. If it succeeds so much the better, for if a French Air Ministry should be established, especially if under M. Flaudin, it is certain that not only would French Service Aviation be improved by the appointment of flying officers to higher posts in place of the non-flying army men who now occupy them, but that Civil Aviation would be better organised.

As things are French civil aerodromes are almost chaotic in their lack of organisation. Le Bourget, the great Paris terminal aerodrome, is a case in point. For instance, recall the arrival of the Bristol ten-seater at Croydon a few weeks ago with her undercarriage festooned with planks which she picked up in the fair-way at Le Bourget. Any pilot who uses Le Bourget can reel off examples of analogous absence of method. Matters of petrol supply or petrol monopoly—there are particularly worth investigation.

#### Inadequacy and Inaccuracy.

But perhaps the worst thing at Le Bourget is its wireless organisation—or rather disorganisation. It is a common oc-

currence for an aeroplane to arrive at Croydon before its departure has been notified from Le Bourget, and quite often its departure is not notified at all, so that the figures for the Aircraft Movements Board at Croydon have to be supplied by the pilot himself.

Then again the weather reports received by wireless from Le Bourget and St. Ingelvert are so hopelessly unreliable as to be dangerously misleading. It would seem almost as if the meteorological experts at both aerodromes base their observations on whether the windows of their offices have been cleaned or not. A dirty window on a fine day might well produce a report of "Visibility 1,000 metres" when in fact it is about 20 miles, and a clean window on a dull day might equally lead to excessive optimism as to visibility. At any rate the discrepancies between the official weather reports from those stations and the contemporary observations of pilots thereat seem to indicate some such factor in the French official procedure.

The undesirability of British pilots relying on French wireless communications, or *vice versa*, is increased by the fact that neither pilots nor wireless operators can be expected to speak each other's language correctly, and by the fact that a wireless operator will naturally pay more attention to an aeroplane which speaks to him in his own language.

#### The Lesson.

The lesson to be learned from this distressing affair is that the British air lines must have their own wireless control and observation posts in France and that the French must have their own in England. There must be a definite rule as to the route to be followed by London-Paris and Paris-London aeroplanes. And each and every machine must be kept on its correct course by directional wireless at those posts.

To try and run air lines over such a route as that between London and Paris without definite regulations and without wireless control and directional wireless is as criminally dangerous as it would be to try and run express trains along a single-line railway without signals and without a block system. The Civil Aviation Authorities in England and in France should have known that much. Moreover they have been warned over and over again of the need for proper control. They have neglected those warnings. It is they and they only who are responsible for the deaths.

#### The Victims.

If these deaths bring about a reform of those Departments as at present constituted, and if a proper organisation of the air route is established in consequence, then the lives of the victims will not have been wasted. They will rank with the other martyrs to the Conquest of the Air through whose deaths improvements have come into existence.

To the Compagnie des Grands Express Aériens one offers deep sympathy. They and their "Goliaths" have a fine record for safety and reliability built up in more than two years of consistent flying and honest hard work. It is lamentable that such a record of freedom from serious accident should have been spoiled by the apathy, carelessness, obstinacy, or ignorance, whichever it may be, of the French and British Civil Aviation Authorities.

Equally one offers condolences to the Daimler Airway, which made so satisfactory a beginning a few days earlier after many months of careful organisation. It is surely the irony of fate that after several years of civil flying free from serious accident, one of our most modern aeroplanes flown by one of our most expert pilots and operated by exceptionally competent people should have been concerned in what is certainly the most sensational accident that has occurred since commercial flying began.

Nevertheless one regards it as a good omen by the Daimler Airway in that no passengers were lost and because in many years' experience one has found that any undertaking which begins with a set-back is more likely to succeed in the end than one which begins its career with immediate success. Therefore, while sympathising with Colonel Scarle and Major Woods Humphrey in their connection with the accident one looks forward to congratulating them ere long on achieving notable successes in commercial flying.

Finally, one wishes to reiterate the statement that the Civil Aviation Authorities of France and England are both separately and severally guilty of the deaths which have occurred. If the officials of either nation had done their duty in the positions to which they were appointed, even if the officials of the other nation had neglected their duty, the accident could not have happened. The dead are the victims of official incompetence.—C. G. G.

#### OFFICIAL SYMPATHY.

The following message of condolence has been sent by the Secretary of State for Air to M. Laurent Eynac, French Under Secretary of State for Air, and to the Chairman of Daimler Hire Ltd.: "In my own name and that of the Air Council I offer you my deep sympathy on the fatal air collision which occurred yesterday, the only accident of this kind in the history of air transport between Great Britain and France."

"(Signed) FREDERICK GURST (Secretary of State for Air)."



## R.A.F. SPORTS AND PASTIMES.

## The R.A.F. Rugby Cup Final.

[The final of the R.A.F. Rugby Cup was an excellent display of the spirit which animates the new R.A.F. That the R.A.F.'s most coveted trophy should be won by a team composed of a group-captain, nine air mechanics, a doctor, three flight-lieutenants, and a flying officer is evidence of the way in which all ranks work and play together for the honour of their Service and their unit. May the result of this competition be a happy omen for the future of the R.A.F.—C. G. G.]

At Uxbridge on April 1st, Flowerdown defeated Cranwell in the final of the R.A.F. Rugby Cup by 5 points (one goal to 3 points (one penalty goal)). It was a great disappointment to the "some hundred" enthusiasts from Winchester to find themselves practically in possession of the field, with no spectator opponents on whom to vent their vocal prowess and praises of their idols. Some fifty had come all the way by *chars-a-bancs* through country reminiscent of an old-fashioned English Christmas and in spite of the rigours of the journey arrived with spirits unabated. They were rewarded for their pains by one of the finest inter-unit games ever seen.

Flowerdown fielded practically the same side that has had such splendid success throughout the season, while the Cranwell side included one and nine-tenths international in the persons of F/Lts. C. N. Lowe, M.C., D.F.C., and S. P. Simpson.

Flowerdown won the toss and started with the advantage of a fairly strong but variable breeze. The forwards immediately got busy and were soon quartered in the enemies' lines. Early on Wale brought off one of his elusive runs and essayed a drop kick at goal. This is his speciality, but unfortunately he was tackled just as he kicked and the ball, although going dead true, failed to rise.

Cranwell then attacked and drove their opponents back in spite of fierce opposition. Simpson made a fine effort to get through, but was tackled and brought down just when he appeared to be really dangerous. A scrum resulted and the referee awarded a free kick, presumably for off-side. Lowe took the kick and from about 40 yards out dropped a perfect goal. The kick was a masterpiece, as the ball had to overcome a strong cross wind.

Flowerdown now took up the attack with redoubled energy, and for nearly a quarter of an hour pinned Cranwell practically on their goal-line. At one time—from a scrum—nearly all the forwards on the field were over the Cranwell line, but the ball was touched down by the defenders in the nick of time. The resulting kick brought momentary relief, but Flowerdown were not to be denied and came again to the attack. Their reward came about 30 minutes from the start, from an open scrum near the Cranwell line Grp/Capt. Warrington-Morris secured the ball and passed to McIndoe, who fought his way through about four opponents and touched down amidst frenzied applause.

Cracknell took the kick and converted with a really fine effort. The angle from which the kick was taken and the cross wind made it a difficult business to convert, and great was the glee and vociferous applause when the ball sailed dead true between the sticks. Half-time found Flowerdown still pressing, but no further score was registered.

The second half was even faster than the first, and the play changed from end to end with amazing rapidity, first one side attacking and then the other. About 15 minutes after the restart Cranwell put in a terrific spell of pressure. Lowe was performing wonders for his side. Time and again he stopped the opposing forwards and drove them back with some wonderful touch-kicking kicks. For ten minutes or so Flowerdown had a nerve-racking time, but some fine work by Butcher, Wale, and Sugden relieved the pressure and once more the Cranwell line was threatened. But only for a minute or two—back came Cranwell, and Lowe beating half a dozen opponents made a superb effort to score with a drop kick, the ball passing only just on the wrong side of the post.

A few minutes later the same player tried again, the ball striking the upright a couple of feet below the cross-bar. Flowerdown again returned to the enemy half only to be driven back. Then Cranwellites came with a rush and the hearts of the Southerners leapt into their mouths when, two minutes from time, a wonderful attack was frustrated in the very nick of time within 10 yards of the Flowerdown line. Brookes secured the ball and with a beautiful kick found touch some 30 yards ahead, and the final whistle went.

The game was a rare one—fast, clean, exhilarating, full of incident and fine play, and deserved far greater support.

For Cranwell, Lowe played like four men and twice came within an ace of winning the game for his side. Of Flowerdown's side it is difficult to say who stood out—each man played with every ounce of energy he possessed, but by common consent F/Lt. Butcher at back played the game of his life, while Grp/Capt. Warrington-Morris, F/Lt. Sugden, and AC/2 Wale paid such kindly and successful attention to F/Lts. Lowe and Simpson that the splendid activities of these redoubtable foes were considerably curtailed.

As he left the field—accompanied by Mrs. Warrington-Morris—the Flowerdown skipper was cheered to the echo by the frantically elated Winchesterites, and the quality of their cheers and the tone thereof spoke volumes for the esteem and affection in which he is held by them.

The Flowerdown team were: F/Lt. F. L. C. Butcher; S/Ldr. A. L. Gregory, M.B.E., M.C., AC/2 J. M. Wale, AC/2 R. A. Cracknell, and AC/2 J. V. Morris; F/Lt. R. S. Sugden, A.F.C., and AC/2 J. Brookes; F/O. W. A. Duncan, F/Lt. A. J. Long, Grp/Capt. A. D. Warrington-Morris, C.M.G., O.B.E., AC/2 J. McIndoe, M.M., AC/2 H. W. Jervis, AC/2 T. Young, AC/2 J. Jewison, and AC/2 S. V. Collins.

## THE NAVY ESTIMATES.

In the course of the debate on the Navy Estimates in the House of Commons on March 12th, Rear-Admiral SUTER said: "I want to deal with capital ships and their value. Opinions are gradually being formed from the United States' experiments and the experiments in France that the capital ship is of little or no value. I think that the capital ship is practically obsolete, though it may have a potential value. There are other admirals who have similar opinions."

Admiral Sir William Lowther Grant writes:—

"By most people who have studied the subject and by most naval officers the usefulness of capital ships is regarded as problematical under existing naval and international conditions, and as still more problematical 10 years hence."

Another admiralty officer refers to Admiral Sims, a very great scientific naval man, declared:—

"Battleships are now obsolete, and only submarines and aeroplanes can be regarded as proper weapons of defence. France has abandoned the construction of battleships and is providing for the construction of light cruisers, mine-layers, destroyers, submarines and aircraft carriers. These are the units which we should develop. I want to ask you one question. I want to know the answer. I enquire why did not our Grand Fleet do all they might have done? It was because the Admiralty had not developed aircraft. Had we had a few Zeppelins, and had we had some aeroplanes, we should have been able to ship the enemy on the morning after Jutland. We were deprived of the fruits of the victory of Jutland because of the shortsightedness and stupidity of the Board of Admiralty in not developing aircraft."

If we had had a few Zeppelins and torpedo aircraft the morning after Jutland, we would have got every ship, and it was due to the stupidity of the Admiralty in not developing aircraft. Their policy was against the advice of naval officers. I challenge the Parliamentary Secretary to dispute these points."

In 1914 we sent four torpedo seaplanes to Mudros to torpedo any enemy ships which they could find. They found no targets and they got three hits. A little later we sent two torpedo seaplanes to Mudros to attack the *Goben*. These seaplanes arrived three days before the *Goben* was floated off. I should like to ask the Parliamentary Secretary why a torpedo attack was not delivered on the *Goben*.

There is a criticism made in this House that the Admiralty did not know what airmen to put into the carriers. I suggest that the remedy for this criticism is to put airmen in command of the carriers.

Sir R. HALL, Naval Airman: Yes, young naval airman in command of the carriers.

The Hon. and Gallant Member (Sir R. Hall) made a speech the other day on the Navy taking over the Air Service. He said that the Admirals who commanded the Fleet in the War have had experience of aircraft and that they now want to separate Navy and Air. I would now ask if any of those admirals who commanded Fleets in the War assisted the Naval Airman in any way to develop the Air Service. I know that from 1900 to 1919 the First Sea Lord did nothing whatever to help the naval airman.

The PARLIAMENTARY SECRETARY to the ADMIRALTY, replying, said: As the speech of the hon. and gallant Member who has just said that the Admiralty in which the hon. and gallant Member has been directly challenged, I think it is as well that I should get up at once to reply. The hon. and gallant Member naturally has a high opinion of the possibilities of the Air Service, but he has too low an opinion of the offensive and defensive value of the battleships. I am entirely with him in wishing that we had made greater progress before the War and had been equipped at the Battle of Jutland with the kind of air equipment that we have today. Admitting that the power of the Air Service is likely to increase we yet came definitely to the conclusion that the increase of strength in the battleship was more than sufficient to be a match for those developments.


The Secretary of State for Air replied to the hon. and gallant Member's remarks that the hon. and gallant Member said: "The *Dreadnoughts* of bombs dropped close by in the water. It is perfectly true that they will have the same effect as a torpedo but the modern battleships are coping with this. The hon. and gallant Member says that Jutland has been that battleships constructed since Jutland are overwhelmingly superior in their offensive and defensive armament to any ship of the pre-Jutland period."

I quite admit the increasing importance of the air. Nowhere is that importance more fully and clearly recognised than at the Admiralty. We are only too anxious to lift the Navy more and more out of the water into the air, and we are convinced that we shall have the freedom to be able to develop our strength in the air on these lines.

Rear-Admiral ADAIR: We have so much in our minds the maritime war in the North Sea that we cannot get away from the fact that we consider the Pacific, the Atlantic, the China Sea, the Indian Ocean. With regard to aircraft, their radius of action is very small, and they will not in our time be able to cover those waters. They have to be taken into the air and a carrier and a carrier is a very big and a very smaller but better armed ship. That smaller but better armed ship is liable to be attacked by a rather larger ship and that larger ship by a smaller ship. I am sure that we have a very big and a very small ship back to the capital ship, whatever the capital ship may be, and I do not say that it is a battleship of the present day.

Viscount CURZON, in the course of a speech, said: The hon. and gallant Admiral also asked what has the First Sea Lord done for air power in the Navy between 1900 and 1918. From the moment the present First Sea Lord took over command of the Grand Fleet air power was developed in the Navy. It was developed in the Navy before. Every battleship at the end of the War was carrying at least two aeroplanes.

Rear-Admiral SUTER: May I submit that it was then too late? Rear-Admiral CURZON: I agree. The First Sea Lord has never had a chance before. Aircraft carriers were being employed to an extent they never had been. Air reconnaissance was being undertaken and the air was being used in every direction in every direction. It was a very big task to make. He (the First Sea Lord) never got a chance before, and as soon as he did a great deal was done. I agree that a great deal may be done in the case of aircraft, and that the Committee on the Jutland being in an aeroplane instead of on his ship the result of the battle would probably have been very different.



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## THE WEEKLY COMMENTARY.

Owing to the great pressure of urgent news upon the very limited space available it has been necessary to suspend until this week the final instalment of Capt. Sayers' articles on "The Commercial Aeroplane."

His final conclusion, that it is now time that aeroplane design was regarded from the point of view of an endeavour to produce an aeroplane which is one body, and not an assortment of components, is worthy of serious consideration.

The very interesting little single-seat amphibian flying-boat which has just been built by the Supermarine Aviation Works, described in some detail in this issue, represents a serious effort at the production of a greatly

needed type of aircraft. Despite any enmity for the Royal Air Force which may exist in some branches of the Admiralty, Naval aircraft are of very great importance to the security of the British Empire, and those who give their attention to the development of such special craft will inevitably receive a due reward—if they can survive the present lean times.

The new scheme for the operation of airships on Inter-Imperial routes which has been advanced by Cmdr. Burney, with the support of Vickers Ltd. and the "Shell" financial group, is outlined in this number. An official statement indicates that, subject to certain modifications, the scheme is receiving serious attention.

## THE COMMERCIAL AEROPLANE.

By W. H. SAYERS.

### VII. Conclusion.

Let it be supposed that ample trials of machines on the general lines suggested in the last instalment prove that the type is impracticable as a real aeroplane. The most likely causes of serious trouble are disturbance of the general flow by the airscrew and by the pilot's cockpit. A machine with a pusher airscrew would possibly overcome both these difficulties. It is not quite so easy to produce a practicable shape of so satisfying an appearance as that of the tractor type, but it is possible to arrive at a form which looks like a great improvement on the average present-day machine.

Fig. 3 indicates schematically a possible arrangement which is really nothing more than the Caproni twin fuselage plus central nacelle arrangement, except in so far as the body and wing are faired one into another as in the previous case, and the fuselages, which are deep and narrow, are extended down to enclose the undercarriage.

The pilot would be seated in the nose of the centre section which can be adequately glazed, and it is not impossible that if arrangements are made to make his compartment otherwise airtight a front window might be opened without any serious increase in resistance.

Purely as a glider, this type would almost certainly be inferior to the tractor arrangement, but quite possibly as an

engined machine it might prove superior. There is no reason why it should be seriously heavier, though the twin "tail booms" would almost certainly be heavier than the single body of equal strength. The resistance of the two tail booms would be appreciable, but this loss might be offset by the probably better form of the wing and body combination.

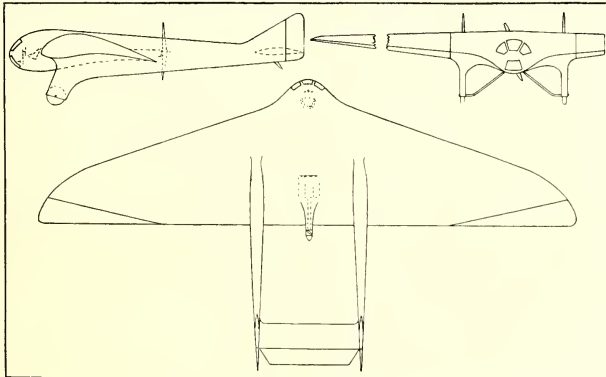
It is probably not necessary to indicate other than generally how one would proceed if even this type proved impracticable owing to the presence of slip stream over the tail surfaces. A great sweep back on the wings, accompanied by a reduction in the incidence and camber at the tips, and the mounting at the wing tips of vertical and horizontal surfaces would be an obvious next step. This would produce a "Dunne" tailless type of machine.

The most serious possibility is that the presence of a rotating airscrew either behind or in front of an aeroplane of really high efficiency will be found to upset the whole system of flow. The only methods available to meet this difficulty will be either the use of some entirely novel form of propelling mechanism—i.e., jet propulsion or the like—or to do to the airscrew what has already been done to other disturbance creators—that is, put it where it will not

### HOW AN EFFICIENT "PUSHER"

**MIGHT BE MADE.**—This illustration shows diagrammatically how it may be possible to build a machine with the pilot totally enclosed, yet having an excellent view, with the wings entirely out of the airscrew slip-stream, and yet obtain a high aerodynamic efficiency.

The general design is based on considerations exactly similar to those which were involved in the tractor type previously discussed. The aim has been to produce one low-resistance body, and not an assembly of parts.



affect the flow round the machine as a whole. This may not prove to be as impossible as at first sight it sounds.

One might, for instance, build a central "body" to the machine of very great diameter, and perforate it with a central channel of "Venturi" tube section, which would allow the airscrew to operate in its interior, so that the inflow ahead of the body was relatively undisturbed and the slip stream was discharged clear of any working surfaces. The losses within the tube would be fairly large, and such a body would probably be heavy to build.

The question as to whether it would be justified can only be settled when there is some reasonably accurate information as to how high an efficiency one can attain from a glider, and how much the disturbance caused by the airscrew will interfere with that efficiency in practice.

At the moment there is no need, practically, to consider the problem of putting the airscrew inside the body. There is a very large room for improvement in the aerodynamic efficiency of aeroplanes before such refinements are at all likely to be necessary.

It has been the object of these articles to point out that at the present moment aeroplane design is suffering from something very like stagnation.

This stagnation has resulted from a set of circumstances

which have forced research workers and aeroplane designers into a relatively shallow groove of work and thought with the result that they have grown to regard the aeroplane as a series of component parts, connected mechanically, but aerodynamically nearly independent, and it is suggested that the correct attitude for the designer is to regard the aeroplane as one body aerodynamically, and to set about shaping it to produce the airflow which is necessary to its functions with the minimum of undesired disturbance and consequent loss.

The aeroplane shapes which have been put forward are of course nothing but guesses. They are merely the authors' idea of the kind of form which is worth trying and some attempt has been made to estimate—as conservatively as possible—the degree of improvement which one may reasonably expect from successful experiment on such lines.

Quite apart from this particular set of suggestions it is desired to emphasise the fact that at the present moment so little is known of the science of aerodynamics, and so many problems of vital importance to the designer are yet awaiting a solution, that progress in aeroplane design cannot yet be safely limited—as it has been for the past few years—by the adoption as a fundamental principle of the present very questionable basis for design that is afforded by wind tunnel tests and the current deductions therefrom.

## THE SUPERMARINE SINGLE-SEATER FIGHTER AMPHIBIAN.

The Supermarine single-seater amphibian flying-boat has been specially designed by the Supermarine Aviation Works, Ltd., of Southampton, as a high performance fighting scout, and is specially adapted for getting off gun-turret platforms of capital ships, or getting off and landing on the decks of aircraft carriers.

It is essentially a sea-going machine, built expressly for sea-going purposes. The strength and design of the hull are such that it can operate on and from the water under weather conditions in which it would be impossible to operate any other type of seaplane of equal size.

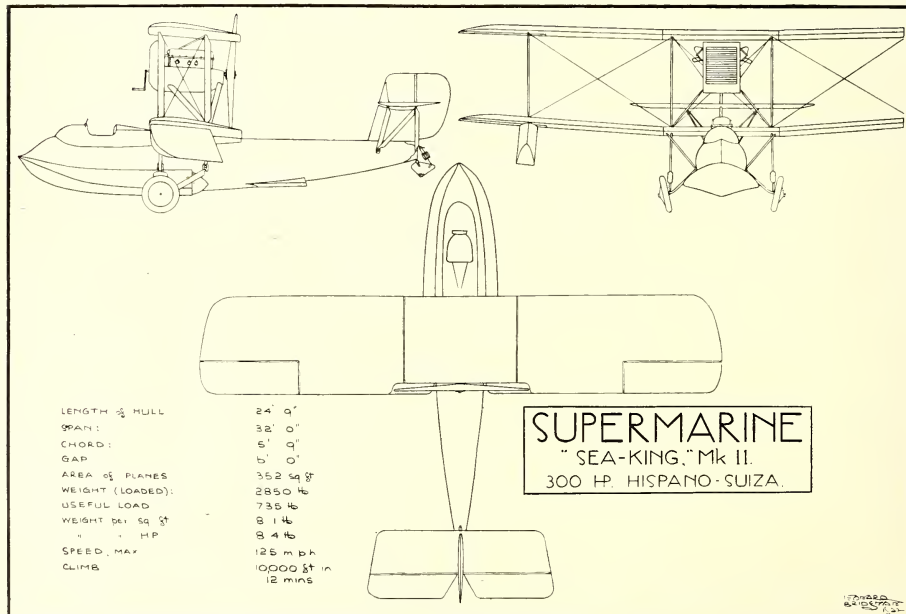
The manoeuvrability of the "Sea King" Mark I, as this machine is called, is one of its most important features. It can be looped, rolled, spun, and stunted in every possible way, is exceptionally quick and light on controls, and has none of the unpleasant tricks so often found in flying-boats.

Longitudinally, the machine is neutral, and flying at any speed throughout its entire range either with engine on, gliding, or climbing, no load is felt on the control stick. This balance has been obtained entirely on the stabilising surfaces, and no mechanical adjustment by the pilot is required.

The hull is of circular construction with built-on steps, either of which can be replaced in case of damage. The steps are divided into watertight compartments, the top side being of single-skin planking, covered with fabric treated with a tropical doping scheme. The form of hull is clearly shown in the scale drawing and by a sketch (Fig. 1).

The engine, a 300-h.p. Hispano Suiza, is mounted in a streamline nacelle, which also contains oil tank, radiator, and shutters, piping, controls, etc. The whole unit is very accessible and the engine can be replaced very easily. The self-starting magneto is carried in the streamlining behind the pilot's seat, and to facilitate starting, the front portion of this streamlining hinges down and forms a step from which the starting handle can be reached. This is shown in Fig. 2. The radiator is mounted independently of the engine, and is quite free from vibration even should the engine be missing badly.

Interchangeability and ease of upkeep and repair have been carefully studied. The complete wing structure, including power unit, can be removed from the hull by withdrawing eight bolts. The wing structure consists of top and bottom centre sections, and top and bottom planes of equal span.



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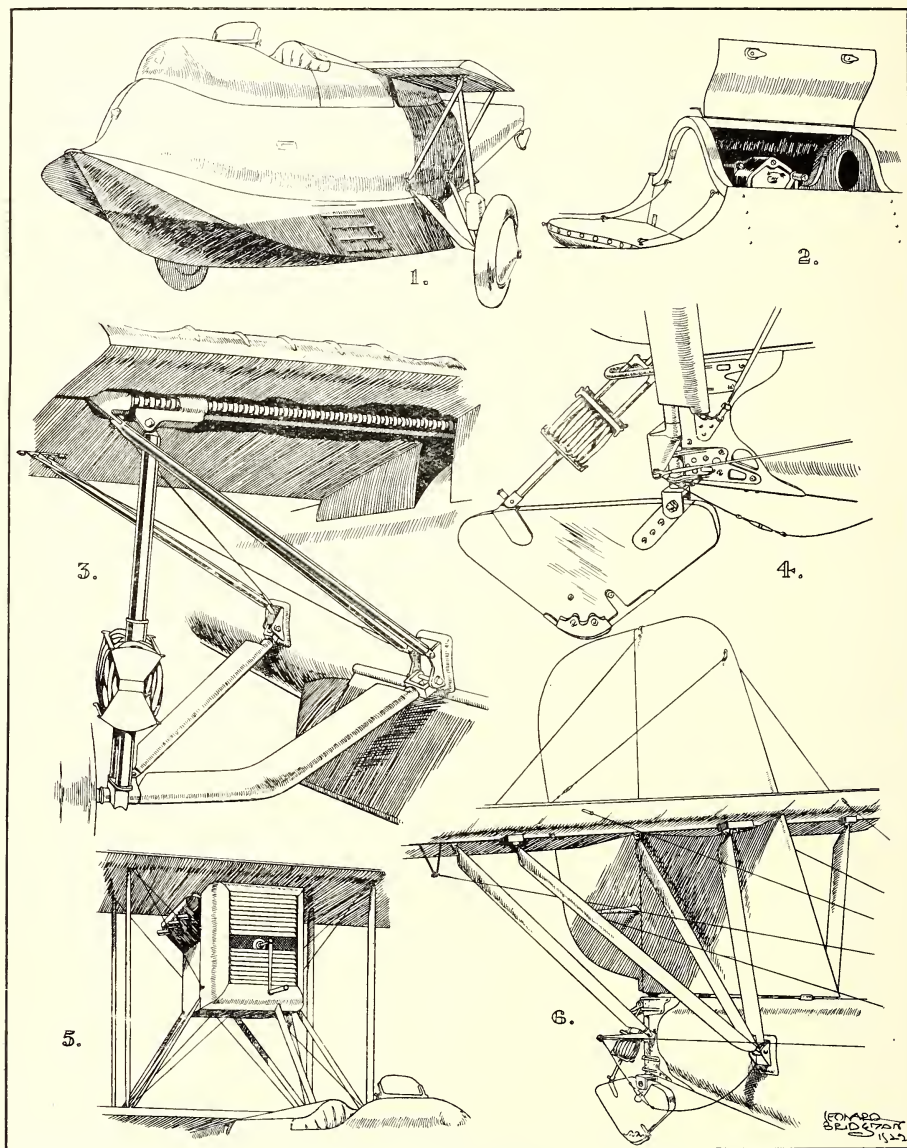
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One set of struts are carried on either side of the centre section. The top planes have a dihedral angle of  $14^{\circ}$  and the bottom planes one of  $31^{\circ}$ . The engine unit is carried on two sets of inwardly inclined N struts (Fig. 5), and can be removed and replaced without interfering with any wing structure member.

The petrol supply is by pressure, and every effort has been made to reduce the length of piping and eliminate as much as possible the carrying of piping into the hull.

The amphibian undercarriage, which can be removed by the undoing of ten bolts in all, folds up under the wings, and when folded is well clear of the water. It is raised and lowered by a worm and bevel gear, as shown in Fig. 3. The operation of winding moves the slide to which the vertical strut is attached. The lower end of this strut is hinged to

the hull by a steel tube Vee. The vertical strut carries a rubber shock absorber.

The pilot's cockpit is in the nose of the boat and gives an almost unobstructed view in every direction. The equipment consists of a complete set of instruments, anchor and cable, bilge pump, towing fairleads and make-fast cleats, boathook, engine and cockpit covers, towing bridle and lifting slings, "Pyrene" fire-extinguisher, Lewis gun and six double trays of ammunition.

The tail-unit consists of fin and rudder of ample dimensions and a monoplane tail plane with reversed camber. This is shown in Fig. 6.

The steerable tail skid is carried under the extreme end of the hull and is fitted with rubber shock absorber of a similar type to that used on the main undercarriage.

## AN APPRECIATION OF THE DH9c.

The following is an extract from a letter recently received from the Compañía Española de Tráfico Aéreo—the Spanish aerial transport company which is running the Seville-Larache Air Line:—

“On the occasion of the completion of the first three months during which we have been operating the first Spanish air service between Sevilla and Larache, we should like to take the opportunity to place on record our satisfaction with the material and personnel provided by you. Using these exclusively, you will be pleased to hear that we have, since the inauguration of our service on October 15th, 1921, till January 15th, 1922, successfully completed 85 return journeys. This represents 42,500 kilometres covered without difficulty or mishap and an incalculable saving in time and increase in regularity over the existing means of transport.”

The above company is using DH9c machines exclusively supplied by:

**The De Havilland Aircraft Co., Ltd.,**  
**Stag Lane Aerodrome, Edgware, Middlesex, England.**

TO BE PUBLISHED THIS WEEK.

## “ALL THE WORLD’S AIRCRAFT” OF 1921.

**Edited by C. G. Grey.**

The new edition of this well-known Annual will be found to be of even greater value and interest than have been the previous volumes.

The arrangement has been modified in a manner which will increase its value as a work of reference

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The section dealing with airships gives an accurate account of the present position in regard to this type of aircraft.

Sections dealing with the helicopter and with gliding and soaring craft are included.

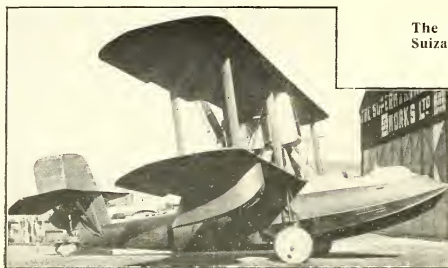
It is NOT merely a revision of previous volumes—it consists mainly of entirely new matter relating to the year 1921.

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**Is a necessity for all who wish to be accurately and fully informed upon current Aerial affairs.**

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The Supermarine "Sea King" Mark I (300 h.p. Hispano-Suiza) which is designed for deck flying and Naval fighting purposes.



In spite of its small dimensions the machine is very seaworthy. It can be quickly and easily manoeuvred in the water in a wind of 30 m.p.h., and is capable of riding out a fairly heavy sea. It is very clean on the water, and the cockpit is quite dry under all conditions. Special provision is made for the protection of all parts against the corrosive effects of seawater, gummetal and stainless steel being used where possible, and all fittings are specially treated.

The machine is a very creditable attempt to produce a small, seaworthy, highly manoeuvrable flying-boat, and the amphibian landing gear at once renders it practically immune from damage caused by launching from concrete slipways by means of beach cradles. It also saves the expense of a handling party and launching crew, as the machine can taxi up or down the slipway as well as operate from an ordinary aerodrome. The workmanship, and care given to the smallest detail, is up to the excellent Supermarine standard; therefore little else need be said of it.

The specification is given on the attached scale drawing.

### THE AIRSHIP'S LAST CHANCE.

At the last possible moment a still further scheme to rescue the British airship equipment from the scrapheap has been laid before the Air Ministry. This scheme, on the face of it, seems to be of a type much more likely to be acceptable to both the Air Ministry and the Treasury than have been those previously advanced.

The scheme has been advanced in the first place by Com. C. Dennis Burney. It is proposed to form a company with a nominal capital of £4,000,000, of which £1,200,000 in ordinary shares and £2,800,000 of debentures are to be issued forthwith. Interest, at the rate of 6 per cent. per annum on ordinary shares and at 4½ per cent. per annum on debentures (both free of income tax), is to be guaranteed for a period of ten years by the Governments served by the scheme. The contingent liabilities thus to be assumed by the Governments are:—Great Britain £100,000 per annum, and Australia and India £40,000 per annum each.

It is proposed that no dividend be payable during the first year's operation, and therefore the present Budgets have not to provide for any expenditure on this account.

Vickers Ltd. and the "Shell" group have each undertaken to subscribe £100,000 of the required capital at par.

The British Government hands over the existing airships and equipment free of charge as in previous schemes. The present ships will be used only for short-distance experimental and training work. The company's estimates provide for the building of five new ships of about 3½ million cubic feet capacity, and for the development of the service in two stages, firstly a bi-weekly service to India, and later an alternate day service to India with a weekly extension to Australia.

On the basis of certain improvements in technique which are stated to be now practicable and to the all-round reduction in costs of material and labour, the promoters estimate that the costs of such services will be less than one-half of the estimates given to the Conference of Dominion Premiers, and that the company should be able to make some profit at the end of the second year of working, and to relieve the Government of any liability before the end of the ten-year period.

The scheme has the great advantage that the Governments concerned are not asked to find any large sum by way of capital, and that the annual cost to them of making an experiment which certainly ought to be made at the earliest possible opportunity is quite a small one. Despite one's general objection to subsidisation of any kind, this particular case seems to be justifiable, because whatever may be the practical results of the company's trading operations, they will provide definite useful information as to the capabilities of airships for long-distance transport which by itself will be worth the cost.

And it does seem that unless some form of guarantee is given Britain will have to acquire her knowledge of this particular branch of transport work at second-hand.

The technical advances to which the promoters refer as helping greatly towards the reduction of operating costs are of some interest and importance. It is stated that a carburettor is now available which satisfactorily solves the problem of burning hydrogen in combination either with petrol or with heavy oil. This claim is, one believes, substantiated by a very high authority on internal combustion engines. The result is that a great reduction can be made in the weight of fuel carried, and a consequent considerable increase in useful load. The use of hydrogen in this way conduces to a longer life of the engine and to a less frequent need for overhaul.

And, finally, it is claimed that a cellulose substitute has been found for goldbeater's skin which is at least as good as that material, and reduces the cost of gasbag construction to a very great extent.

In connection with this scheme the Air Ministry has issued the following statement—

"The Imperial Airship Scheme submitted by Commander Burney has been under the consideration of the Air Council. In its original form as communicated to the Press the Air Council regarded the financial conditions as imposing altogether too heavy a liability on the Government. Commander Burney has since made certain modifications in that scheme, and the revised proposals are being further considered by the Air Council. The existing airships and the airship bases at Cardington and Pulham are still in the possession of the Air Ministry, and have not been actually handed over to the 'Disposal Commission.'"

### THE INSTITUTION OF AERONAUTICAL ENGINEERS.

On March 31st, at the theatre of the Royal Society of Arts, Mr. H. B. Folland, the designer of many well-known aircraft, read a most instructive paper on "Acroplane Design" before the Institution of Aeronautical Engineers.

The paper was of an entirely practical nature, dealing with the methods developed by the writer from his long experience in laying out the design of any normal type machine. It might fairly have been called "Practical Hints to Aircraft Designers and Draughtsmen," and dealt in very detail with both the process of laying out preliminary design, and with the important practical points which arise in the design of details. The paper is unfortunately far too long to reprint in "Aeronautical Engineering," and from its very nature cannot be abstracted without losing its virtue. It is to be hoped that the Institution will reproduce it in full, and that it will find its way into the hands of all students of acroplane design, and all aeronautical draughtsmen.

### THE AIR LEAGUE OF THE BRITISH EMPIRE

The Duke of Sutherland has accepted the presidency of the Air League of the British Empire, in succession to Maj.-Gen. the Rt. Hon. J. E. B. Seely, C.B., C.M.G., D.S.O., who has resigned.

### NEW COMPANY.

JAMES H. RANDALL AND SON LTD.—Private company. Registered March 22nd. Capital, £7,000 in £1 shares (2,000 non-cumulative 7 per cent. preference). To take over from J. H. Randall and E. J. Randall the business of metal workers, motor, aircraft and watercraft engineers, motor body and motor boat builders and repairers, radiator, and tank manufacturers and repairers, manufacturers of motor-car, aircraft, waterplane and cycle parts and accessories, etc., carried on by them at Green Street, Paddington Green, W. The permanent directors are: J. H. Randall, Woodlands, The Hyde, Hendon, Middlesex, and J. E. Randall, of the same address.

Qualification: 100 shares. Remuneration of directors, as managing directors, £500 per annum. Registered office: Green Street Works, Paddington Green, W.2.

### MORTGAGES, CHARGES & SATISFACTIONS.

BRITISH ANZANI ENGINE CO. LTD.—Satisfaction to the extent of £2,000 on Dec. 31st, 1921, of debentures dated Sept. 10th, 1920, securing £10,000 (filed March 30th, 1922).





# COMMERCIAL AERONAUTICS

## AND CIVIL AERIAL TRANSPORT.



### THE UNITED KINGDOM OF GREAT BRITAIN AND IRELAND. CONTINENTAL ARRIVALS AND DEPARTURES.

[The following table of arrivals at and departures from the British Air Ports is compiled on the following system:—First comes the initials of the Air Line; next the type of machine; next the international number of the machine; next the ports of departure and destination; next the times of departure and arrival; next the cargo, whether goods (G) and/or mails (M); next the number of passengers; and finally the name of the pilot and number of mechanics, if any.]

ABBREVIATIONS:—A.D.—Aircraft Disposal Co. E.A.—Berkshire Aviation Co. B.C.—Bristol Aeroplane Co. C.A.—Department of Civil Aviation D.A.—Daimler Airway D.H.—De Havilland Aircraft Co. G.E.—Compagnie des Grands Express Aériens H.P.—Handley Page Transport Ltd. I.L.—Instone Air Line K.L.—Koninklijke Luchtvaart Maatschappij L.A.—Leatherhead Aviation Services M.A.—Messageries Aériennes M.W.—Marconi Wireless Telegraph Co. Ltd. P.O.—Privately owned P.L.—Peters Ltd. S.F.—Surrey Flying Services S.N.—Syndicat National pour l'Étude des Transports Aériens (S.N.E.T.A.).

#### The London Terminal Aerodrome, Croydon. (Telephone: Croydon 2720.)

##### APRIL 3rd:

NIL.

##### APRIL 4th:

M.A., Spad, F-ACMF, London-Paris, 07.10-09.25, G., Nil, Briere.  
D.H., DH8, G-EARO, London-Paris, 11.15-13.15, G.M., 2, Robins & 1.  
H.P., DH8, G-EAWX, London-Paris, 11.17-13.10, Nil, 2, Rogers.  
H.P., DH4, G-EAWH, London-Paris, 12.20-14.16, G.M., 2, Wilcockson.  
M.A., Goliath, F-ADAY, London-Paris, 12.36-15.50, G., 2, Le Men.  
L.L., DH8, G-EAWW, London-Paris, 13.00-17.05, G.M., 1, Holmes.  
L.L., Vimy, G-EASI, Paris-London, 11.50-17.22, G., 2, Brady.  
H.P., Bristol, G-EAWW, Paris-London, 12.50-16.10, Nil, 7, McIntosh & 1.  
G.E., Goliath, F-GEAD, Paris-London, 12.55-16.45, G., 5, McMe & 1.  
D.A., DH34, G-EBBO, Paris-London, 13.55-16.42, Nil, 4, Hinchliffe.  
M.A., Brequet, F-ADBM, Paris-London, 13.55-17.06, G.M., Nil, Challoux.  
H.P., DH8, G-EAWX, Paris-London, 14.45-18.06, G., 6, Rogers.  
H.P., DH8, G-EAWH, Paris-London, 15.00-18.01, G., Nil, Wilcockson.  
L.L., DH8, G-EARO, Paris-London, 15.35-18.48, Nil, 5, Robins.

##### APRIL 5th:

M.A., Brequet, F-ADBM, London-Paris, 07.10-10.30, G., Nil, Challoux.  
D.A., DH34, G-EBBO, London-Paris, 09.40-11.50, G.M., 5, Hinchliffe.  
L.L., DH8, G-EARO, London-Paris, 10.15-12.50, G.M., 2, Jones.  
H.P., Bristol, G-EAWW, London-Paris, 10.30-14.55, G., Nil, Olley & 1.  
G.E., Goliath, F-GEAD, London-Paris, 11.30-14.09, G., 2, Aire & 1.  
H.P., DH8, G-EAWX, London-Paris, 12.30-14.47, G.M., Nil, Rogers.  
M.A., Brequet, F-ADAF, London-Paris, 12.37-15.05, G., Nil, 1, E. Sec.  
L.L., Vimy, G-EASI, London-Paris, 12.52-15.06, G.M., 1, Powell.  
M.A., Brequet, F-CMAK, Paris-London, 07.25-10.20, G.M., Nil, Range.  
L.L., DH8, G-EAWW, Paris-London, 10.10-12.45, G., 8, Holmes.  
G.E., Goliath, F-ADPT, Paris-London, 12.50-15.16, G., 6, Fairclay & 1.  
M.A., Goliath, F-FARI, Paris-London, 13.55-16.40, G.M., 2, Dorr & 1.  
M.A., Brequet, F-CMAG, Paris-London, 13.40-16.42, G., Nil, Paille.  
H.P., Bristol, G-EAWW, Paris-London, 14.35-17.11, G., 7, Olley & 1.  
L.L., DH8, G-EARO, Paris-London, 15.00-17.45, G., 6, Jones.

##### APRIL 6th:

M.A., Brequet, F-CMAK, Paris-London, 07.20-09.35, G., Nil, Range.  
L.L., DH8, G-EAWW, London-Paris, 10.22-12.40, G.M., Nil, Shepperson.  
H.P., Bristol, G-EAWW, London-Paris, 12.24-14.45, G.M., 5, McIntosh & 1.  
G.E., Goliath, F-ADDT, London-Paris, 12.30-14.55, G., 2, Fairclay & 1.  
D.H., DH9, G-EBAX, London-Berck, 12.50-15.16, G., 6, Fairclay & 1.  
L.L., DH8, G-EARO, London-Paris, 13.55-17.35, M., 1, Holmes & 1.  
M.A., Brequet, F-CMAK, Paris-London, 07.10-10.02, G.M., Nil, Delage.  
L.L., Vimy, G-EASI, Paris-London, 10.00-13.11, Nil, 1, Powell.  
G.E., Goliath, F-GEAO, Paris-London, 12.50-15.24, G., 1, Chabamel & 1.  
H.P., DH8, G-EAWX, Paris-London, 12.25-15.13, G., 5, Rogers.  
M.A., Goliath, F-ADCA, Paris-London, 14.10-17.48, G.M., 3, Champertier.  
L.L., DH8, G-EAWW, Paris-London, 15.15-17.49, G., 7, Shepperson.

##### APRIL 7th:

M.A., Brequet, F-CMAG, London-Paris, 07.10-10.50, G., Nil, Paille.  
L.L., Vimy, G-EASI, London-Paris, 10.10-13.45, G.M., 5, Robins.

#### The London Terminal Aerodrome.

Monday of last week was a blank day, snow and sleet and wind being the prevailing elements.

Mr. Stocken, of the Aircraft Disposal Co., has been on leave during the week and Mr. Piercy has been deputising for him. On Tuesday he took up a D.H.9 for a height test and then sent a couple of Avros through acceptance tests. The following day he had out a D.H.9a with an "Eagle" Rolls-Royce engine. This machine is for the Spaniards and is shortly to be flown to Madrid.

On Thursday he took an Avro up for a height test and disappeared above the clouds altogether.

On Friday afternoon Mr. Piercy made a couple of flights on a not-quite-standard D.H.9, of which more later.

Six machines are being prepared for the Easter Monday

H.P., DH8, G-EAWX, London-Paris, 10.28-13.40, G., 3, Olley.  
H.P., DH4, G-EAWH, London-Paris, 12.15-15.25, M., 2, Wilcockson.  
G.E., Goliath, F-GEAO, Ldn-Paris, 12.20-17.40/8th, G., Nil, Chabamel & 1.  
M.A., Goliath, F-FARI, London-Paris, 13.07-14.00/9th, G., 2, Dorr & 1.  
M.A., Brequet, F-CMAF, Paris-London, 07.15-09.38, G.M., Nil, Revencu.  
L.L., DH8, G-EARO, Paris-London, 10.00-12.00, G., 6, Holmes.

##### APRIL 8th:

D.H., DH9, G-EBAX, Berck-London, —12.55, Nil, Nil, Barnard.

##### APRIL 9th:

L.L., DH8, G-EAWW, London-Paris, 11.00-13.45, G.M., 1, Jones.  
M.A., Goliath, F-ADCA, London-Paris, 11.55-17.55, G., Nil, Champertier & 1.  
L.L., DH8, G-EARO, London-Paris, 13.10-17.59, G., 4, Brady.  
M.A., Brequet, F-ADBM, Paris-London, 07.45-11.49, G., Nil, Doncin.  
H.P., DH4, G-EAWH, Paris-London, 08.50-11.22, G., Nil, Wilcockson.  
L.L., Vimy, G-EASI, Paris-London, 10.00-12.48, G., 4, Robins.  
H.P., DH8, G-EAWX, Paris-London, 12.00-14.30, G., 4, Olley.  
H.P., Bristol, G-EAWW, Paris-London, 12.05-14.44, Nil, 5, McIntosh & 1.  
M.A., Spad, F-ADAF, Paris-London, 13.15-19.30, G., 1, Robyn.  
L.L., DH8, G-EAWW, Paris-London, 15.25-18.50, G., 2, Jones.

#### Inland Flying at Croydon.

April 3rd—NIL.

April 4th—L.L., D.H.12 to Stag Lane (Cobham).

April 5th—D.H., D.H.10 to Stag Lane (Barnard).

April 6th—L.L., Vimy, test (Holmes); H.P., D.H.4, tests (Carter); S.F., Avro tests (Muir).

April 7th—D.A., D.H.8, test (Duke); H.P., H.P., test (Wilcockson).

April 8th—D.H., D.H.10 to Stag Lane (Barnard).

April 9th—S.F., Avro, joy-rides (Muir); R.A.C.C., Avro, joy-rides (Haynes).

#### Flying by the Aircraft Disposal Co.

April 3rd—NIL.

April 4th—D.H.9 height test (Mr. Piercy); Avro, test (Mr. Piercy);

Avro, test (Mr. Piercy).

April 5th—D.H.9a, G-EBGC, test (Mr. Piercy).

April 6th—Avro, height test (Mr. Piercy).

April 7th—D.H.9, test (Mr. Piercy); D.H.9, test (Mr. Piercy).

April 8th—NIL.

#### Cross-Channel Statistics.

Week ending April 6th:—

Machines, 60; Passengers, 137; Crews, 200; Total Personnel, 237.

Corresponding week last year:—

Machines, 85; Passengers, 210; Crews, 78; Total Personnel, 288.

Corresponding week 1920:—

Machines, 36; Passengers, 45; Crews, 40; Total Personnel, 85.

On Tuesday of last week the weather cleared somewhat and the air line machines all successfully completed their journeys. Mr. Hinchliffe returned from Paris on the D.H.34 belonging to the Daimler and left for Paris again the next morning accompanied by Messrs. Herne, Robertson, Robinson, and the cabin boy. They arrived safely at Le Bourget. Mr. Hinchliffe remained behind, and Mr. Herne, with the other three as passengers, took the machine on its return journey.

## Royal Mail.

**INSTONE AIR LINE, Ltd.,**

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Telephone—Croydon 2720.

And at  
**Paris, Brussels, etc.**

**52, Leadenhall Street, London, E.C.3.**  
Telephone—Avenue 3616.

have been appointed, in open competition, exclusive contractors by the Postmaster-General for the carriage of the Air Parcel Post to Paris.

Near Berck, owing to circumstances over which it had no control, the machine discontinued its flight in a somewhat unserviceable condition. It is hoped to have it on the Dainleur Airway again very shortly.

Messrs. Shepperson and O. P. Jones are getting on very well with the D.H.18s and the "Vimy," and nobody even watches Mr. Bradley land now. Mr. Holmes did his first solo on the "Vimy" on Thursday and its somewhat flat glide seemed at first to be different from his expectations.

All the air line machines got through successfully in spite of the fact that Handley Page Transport's Bristol carried Mr. Penzance as wireless operator and had Mr. Hill-Heim among the passengers.

On Friday morning Mr. Duke took up the D.H.18 G-EAWO, which on the previous Saturday had been temporarily transferred from Instone's to Dainleur's. The machine had had a new set of wings built for it and the fuselage was painted Dainleur red. This with the silver wings gave her a very pleasing appearance.

Mr. Duke took her up for a short test and landed quite satisfactorily. At 10.00 hrs. he started off to Paris carrying the cabin boy Hesterman and some newspapers. Soon after midday he collided with M. Mire flying a Farman Goliath coming in the opposite direction. The leading article this week deals fully with the case.

The newspapers handled the affair as might be expected. One or two, including the *Express* and the *Evening News*, certainly held the cause of aviation by exceptionally sensible leading articles, but the *Express* eliminated any good which this did by publishing a horrible imaginary drawing.

The Bristol ten-seater started back from Paris about midday, but returned owing to weather, and Mr. Bradley started at 15.00 hrs. from Croydon and landed at Lymington, whence he returned shortly after.

The only pilot to come in or go out on Saturday was Mr. C. D. Barnard of the De Havilland Company, who returned from Berck where the D.H.34 had landed. He found the weather very bad and was compelled to land at Peshurst on the way back. After a short stay he left for Stag Lane.

Sunday was quite a busy day. The Instone Air Line sent a D.H.18 out at 10.00 and 15.00 hrs., and the "Vimy" arrived at 14.30 and another 18 in the evening. On the "Vimy" were two passengers who enjoyed their flight so much that when they were nearing Croydon they asked Mr. Robins to 'phone up Croydon and book them seats on the next machine back. They returned at 15.00 hrs. with Mr. Bradley in the D.H.18 after half an hour in England.

Mr. Muir carried several passengers on his Avro during the afternoon, and Mr. Havens and oneself attempted to get to Stag Lane on a Royal Aero Club Avro, but the fog was so thick over London that we could get no farther than Barnes Bridge and so returned after 75 minutes' flight.

Mr. Larry Carter has now joined Handley Page Transport as a pilot, and on Thursday he was doing some test flights on the D.H.4a which left no doubt as to his ability as a pilot.

The Instone Air Line have now received official approval to run a subsidised service to Brussels and they intend to begin operations on May 1st. It seems probable therefore that they will acquire some new machines, especially in view of the fact that they are in very active negotiation with a firm in the Channel Islands for operating a service between Guernsey and London using amphibian machines.—G. D.

### Leominster.

The Berkshire Aviation Co. Ltd. have just concluded their ten days' visit here at the Easters Meadow. In spite of bad weather they have been kept quite busy, especially with cross-country flights, and have had trips to Hereford, Ludlow, Bromyard, and New Radnor.

A well-known West of England sculptor engaged the machine to take him to Radnor, and the flight was accomplished in spite of hail and snowstorms. On the return journey the sculptor had with him a sitting of duck eggs. He hopes later to be in a position to say that his ducks had flown before leaving their shells. Mr. V. N. Dickinson, a late Redcar instructor, has been piloting the firm's Avro.

### Ludlow.

The B.A. Co. Ltd. arrived here on Friday from Leominster and are booked to remain here during Easter at Ludford House meadow. On Saturday Mr. Geoffrey Le M. Mander, prospective Liberal candidate for North Herefordshire, and a late officer of the R.A.F., flew round the whole of his constituency with Mr. V. N. Dickinson. The flight occupied 2½ hours, the machine landing at Hereford for petrol.

Notices of the flight and a list of the time of arrival over the various villages and towns had previously appeared in the Press; with the result that a good crowd of spectators had gathered to watch the stunts which were performed.

If Mr. Mander continues to show the same interest in the welfare of aviation that he has shown so far, it is to be hoped that he will wrest the seat from his Conservative opponent.

## THE CROYDON EASTER MEETING.

The following is the programme for the Royal Aero Club's Race Meeting on Easter Monday. Under the title of each event appears the name of the entrant of each machine, a description of the machine and engine, and the name of the pilot:—

### THE CLUB HANDICAP.

For all types of machines. Two laps of the circuit. Distance approximately 16 miles.  
Flight—Lt. W. H. Longton, D.F.C., A.F.C. Martinsyde F.4 (300-h.p. Hispano). W. H. Longton.  
Major J. R. Grant (Aircraft Disposal Depot). D.H.9a (400-h.p. Liberty). R. H. Stocken.  
Major J. R. Grant (Aircraft Disposal Depot). Parnall "Panther" (200-h.p. B.R.2). A. F. Muir.  
Flight-Cadet N. Vincent. B.E.2c (90-h.p. RAF). N. Vincent  
The De Havilland Aircraft Co. Ltd. D.H.9b (230-h.p. Siddeley "Puma"). C. D. Barnard.  
Dr. E. D. Whitehead Reid. D.H.6 (90-h.p. RAF). E. D. W. Reid.  
Major Henry Petre, D.S.O. Avro (110-h.p. Le Rhône). H. Petre.  
C. Dudley Palmer. Avro (110-h.p. Le Rhône). C. Dudley Palmer.  
Flying Officer A. F. Ingram. Avro (110-h.p. Le Rhône). A. F. Ingram.  
The Bristol Aeroplane Co. Ltd. Bristol Monoplane (100-h.p. Bristol "Lucifer"). C. F. Uwins.  
Flight-Lt. H. O. Long. Martinsyde F.4 (300-h.p. Hispano). H. O. Long.  
Flying Officer R. S. Carroll. S.E.5a (220-h.p. "Viper"). R. S. Carroll.

### THE SECOND WADDON HANDICAP.

For machines with a speed of not less than 100 m.p.h. Four laps of the circuit. Distance approximately 32 miles.  
Flight-Lt. W. H. Longton, D.F.C., A.F.C. Martinsyde F.4 (300-h.p. Hispano). W. H. Longton.  
Major J. R. Grant (Aircraft Disposal Depot). D.H.9a (400-h.p. Liberty). R. H. Stocken.  
Major J. R. Grant (Aircraft Disposal Depot). Parnall "Panther" (200-h.p. B.R.2). A. F. Muir.  
The De Havilland Aircraft Co. Ltd. D.H.9b (230-h.p. Siddeley "Puma"). C. D. Barnard.  
The Bristol Aeroplane Co. Ltd. Bristol Monoplane (100-h.p. Bristol "Lucifer"). C. F. Uwins.  
Flight-Lt. H. O. Long. Martinsyde F.4 (300-h.p. Hispano). H. O. Long.  
Flying Officer R. S. Carroll. S.E.5a (220-h.p. "Viper"). R. S. Carroll.

### THE SECOND CROYDON HANDICAP.

For machines with a speed of less than 100 m.p.h. Three laps of the circuit. Distance approximately 24 miles.  
Vice-Admiral Mark Kerr, C.B., M.V.O. B.E.2c (90-h.p. RAF). Mark Kerr.  
Dr. E. D. Whitehead Reid. D.H.6 (90-h.p. RAF). E. D. W. Reid.  
Flight-Cadet N. Vincent. Avro (110-h.p. Le Rhône). N. Vincent.  
Major Henry Petre, D.S.O. Avro (110-h.p. Le Rhône). H. Petre.  
C. Dudley Palmer. Avro (110-h.p. Le Rhône). C. Dudley Palmer.

### THE FIRST SPRING HANDICAP.

For machines occupying the first three places in the Waddon and Croydon Handicaps.

Four laps of the circuit. Distance approximately 32 miles.  
PARACHUTE DESCENTS.—Double parachute descent by W. Newell in a "Guardian Angel" parachute. Parachute drop of a dummy man with "H" type "Guardian Angel" parachute showing the use of a resistance parachute in a nose dive. Exhibition of mail-dropping types of "Guardian Angel" parachutes.

BALLOON SHOOTING COMPETITION.—Competitors: Lieut.-Col. C. E. Risk, D.S.O., Capt. A. F. Muir, Flight-Cadet N. Vincent, and F. P. Raynham. Three small balloons will be released at short intervals. The machine will carry a passenger whose object is to shoot down the balloons. An ordinary shotgun will be used, and the competitor who destroys the three balloons in the shortest time will be the winner.

HOW TO REACH WADDON AERODROME, CROYDON.  
By train from London Bridge or Victoria to Waddon.

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By train from London Bridge, Victoria, or Charing Cross to Furley and quarter-hour's walk up the hill to Aerodrome.

By road to Mitcham and thence via Wallington or Mitcham Common. Or to Croydon and thence along tramline to the Aerodrome.

### TO UNEMPLOYED PILOTS.

Any pilots who have had plenty of experience in flying and who are in need of a job are invited to communicate with Mr. H. Shaw, London Terminal Aerodrome, Croydon, giving full particulars of their flying time, machines flown, and how recently they last flew.

Pilots with no recent experience who have done but little time in the air are recommended to waste neither their own nor Mr. Shaw's time.

### THE HANDLEY PAGE CLAIM.

The claim made by Handley Page Ltd. before the Royal Commission on Awards to Inventors has been heard during the past week and is still in progress at the time of writing.

This claim is in respect of the O and V type multiple-engine bombers devised and developed by that firm, particularly in regard to a claim for royalties on the machines made to Handley Page design by firms other than the claimants.

So far as can at present be gathered the proceedings have been both interesting and amusing, and it is hoped that when the case has closed it will be possible to give an informative account of the proceedings.

### PERSONAL NOTICES.

#### DEATH.

HOPKINS.—On April 8th, at Chetesham Hill, Ely, as the result of a flying accident, Pilot Officer George Hopkins, R.A.F.

#### ENGAGEMENTS.

BLOFIELD—FIRMIN.—F.O. Bernard Leslie Blofield, R.A.F., third surviving son of Mr. and Mrs. H. Blofield, of the Woodlands, Sydenham Hill, and Dorothy Evelyn Firmin, widow of J. E. Firmin, Lieut., 5th Batt. Wiltshire Regt., and eldest daughter of Mr. and Mrs. A. G. Chiffertiel, of Iwerleyth, Denbigh Garkins, Richmond Hill.

NEEDHAM—LITTLEWOOD.—The engagement is announced between Evelyn Jack Needham, late Capt. 3rd Northants Regt. and R.F.C., elder son of the late Lieut.-Col. the Hon. Henry Colville Needham, The Gate House, Windsor, and Mary Campbell, only child of the late the Rev. Benjamin Campbell Littlewood, Hillside, Bracknell, Berks.

#### BIRTH.

SANDERSON.—On April 2nd, at 30, Montem Road, Forest Hill, to Margaret (Peggy), wife of F/O. L. T. Sanderson, R.A.F.—a daughter.

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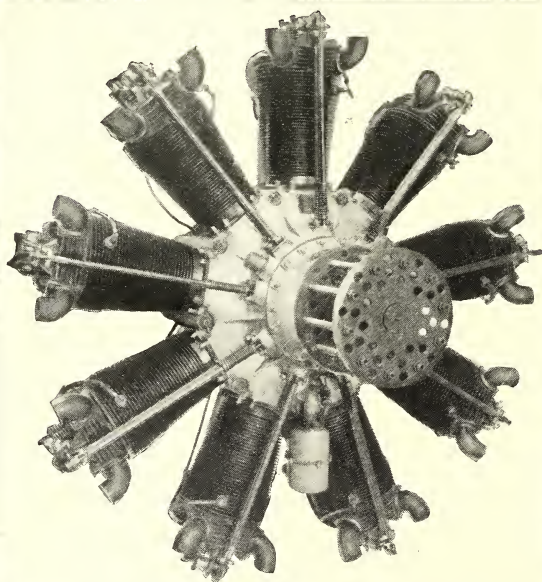
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# THE AEROPLANE

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## THE FRENCH AFRICAN TERMINAL.



RABAT.—The Moroccan end of the Toulouse-Rabat Air Line. Salle is the town on the opposite side of the river. (Photographed by Mr. Sharp from Mr. Cobham's D.H.9 (Siddeley "Puma").

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## ON THE SECOND CROYDON MEETING.

Some day the Royal Aero Club is going to have fine weather for a race-meeting, but that day was evidently not on Easter Monday, for on the occasion of the Club's Second Croydon Meeting the weather differed only in the quality of its badness from the weather of the Club's First Croydon Meeting. It was only the pluck of the competitors and the good will of the officials of the Meeting that prevented it from being a complete wash-out. It was not that the wind was particularly strong, but that it seemed to come straight off the ice and brought with it stinging rain and attempts at hail.

If anybody ever says again that the British Public is not interested in flying then the truth is not in that person, for nothing but the most intense keenness could have brought to Croydon the tens of thousands of people who were in and round the aerodrome. Flying is not like motor racing which draws a crowd of its own composed chiefly of people in the motor trade and otherwise of owners and drivers of cars. The whole of the aircraft trade could be got into a varnish hall of decent size, especially since the bulk of the people who used to be in the aircraft trade have sunk back into the motor trade. And the people who own or fly aeroplanes, outside the R.A.F., could be written down, Christian names and all, on a postcard. Therefore the "gate" at Croydon must be composed entirely of people who are merely interested in flying and are not actual participants in the sport, except as half-guinea joy-riders.

Consequently the only conclusion that one can draw from the very good attendance at the Meeting is that an enormous percentage of the British Public is very keenly interested in flying. Which ought to be distinctly encouraging to the Air Ministry, for public interest in flying means making easier increased Air Estimates in years to come. Which again makes it all the more peculiar that the Air Ministry, or rather the Department of Civil Aviation, does not go out of its way to encourage the sport of flying.

A few weeks ago we were treated to columns of the *Times* filled by an ex-officer of the R.A.F. in a doubtless well-meaning effort to prove that the salvation of Service Aviation lies in spending untold wealth on Commercial Flying. One hopes at a later date to deal faithfully with the aforesaid gentleman and some of his fallacies. At present one need only point out that his arguments were about equivalent to encouraging the breeding of heavy draught horses in order to ensure a supply of remounts for the cavalry. It never seems to have occurred to him that Sporting Flying bears the same relation to the R.A.F. Reserve that hunting and racing does to the cavalry. That being so, if the Department of Civil Aviation to which he seems so deeply attached is to prove the mainstay of the R.A.F. in the future then the least it can do is to encourage flying for sport.

As it is the Department of Civil Aviation does not seem to regard air racing with favour. In fact its attitude rather appears to be that air racing is a trivial and childish thing. It even conveys the impression that air racing is not quite respectable and that competitors in air races are akin to mountebanks, performers on the stage and others who legally are still rogues and vagabonds.

Years ago before the War the Department of Military Aeronautics at the War Office adopted a similar attitude, and one then put forward the argument that it was just as becoming for a Service aviator to fly in public as for an Army officer to ride in the Grand Military Steeplechase—as has always been done by quite good people. There was at that time some excuse for the War Office attitude, for certainly the trade pilots of the period were not quite the fine flower of the British Aristocracy. But to-day that is all changed for the trade pilots of to-day were officers of the R.A.F. three or four years ago.

The much-abused Military side of the Air Ministry seems to recognise the fact for officers of the R.A.F. are now permitted to fly at public meetings—at their own expense—and the Air Officer Commanding the Inland Area, R.A.F., Air Vice-Marshal Sir John Salmond, himself signified his approval by

assisting at the Meeting on Easter Monday. Therefore one suggests that it is just a little ridiculous for the mere civilians of the Department of Civil Aviation to put on airs and adopt a superior attitude towards air racing. It is not as if the Department in question had proved itself a brilliant success and had filled the air with passenger craft whose departures, and arrivals might be impeded by a little air racing. As one has pointed out on various occasions, the Department has been something very like a failure. All it has done has been to spend some hundreds of thousands of pounds on grandiose schemes which have come to naught while it has neglected the simple little matters which might have assured safety to the very limited amount of passenger traffic which it has had to handle.

During the whole afternoon on Monday one air-line machine left Croydon—empty—and two came in from Paris. Altogether the mileage covered by the sporting flying cannot have been far short of that covered by the commercial flying. And the sporting flying provided education and entertainment for a good many thousands of British Taxpayers at no expense to the Nation, whereas the commercial flying did no particular good to anybody—except the pilots and mechanics immediately concerned—and cost the Nation a vast sum.

If the Department of Civil Aviation were wise it would do its best to encourage sporting flying, firstly because drawing a crowd to Croydon is the best possible advertisement for the London Terminal Aerodrome and its air lines, and secondly because, as already stated, if the Great British Public can be interested in flying it will the more willingly stand for an increase in the Air Estimates, in which case it may be possible to allow a little more money in future to the Department of Civil Aviation—so long as it steers clear of grandiose schemes which are the outcome of such excessive foresight as to be out of sight altogether.

The Department's lack of interest in the sport of flying is shown by the fact that it relegated the public enclosures to the lower end of the ground so that the sun would have been in people's eyes—if there had been any sun—and the competitors had to turn over the heads of the crowd in a dangerous position and it was impossible to make proper catering arrangements despite the best efforts of the energetic Mr. Cole and sanitary arrangements simply did not exist.

Last year the Department of Civil Aviation—under pressure—put up a proper railled enclosure for the public in precisely the right place. This year some Smart Aleck went and put up four big new Bessonneux sheds in a line with the enclosure and in precisely the position which ought to be occupied by an extension of that enclosure when a big crowd is expected. These Bessonneux might just as well have been put with their backs to the hedge above the Custom House, but no! Such is the contempt of the Civil Aviation officials for the mere public who pay their wages that they must set up their Bessonneux exactly where they are best calculated to spoil the aerodrome from the public point of view. Either that or the officials of the Department are more extraordinarily stupid than the things which they have done or left undone in the past year would indicate.

When Croydon Aerodrome was started one did one's best in this paper and elsewhere to attract the public to it, so that by popularising the aerodrome one might thereby popularise civil aviation. Apparently the Civil Aviation officials do not want their aerodrome to be popular. Probably they prefer it to remain a wilderness populated only by a small number of minor bureaucrats. At any rate the public in mass and sporting aviators, as distinct from aerial bus-drivers, are not welcome at the aerodrome. Therefore one suggests that the Committee of the Royal Aero Club will do well to consider holding future meetings elsewhere.

Perhaps Colonel Lindsay-Lloyd might like to join the forces of the Royal Aero Club and the Brooklands Automobile Racing Club and so revive the good old days at Brooklands. Then the bureaucrats of the Department of Civil Aviation could devote themselves to their aero-buses and taxis, and spend their days in undisturbed contemplation of nothing at all,



bar the interruption caused by an occasional commercial aeroplane drifting into or out of the aerodrome. It only costs about £100 per six-guinea passenger for the administration of the cross-Channel route. It would be a pity to reduce this figure by making the Civil Aviation officials do something to help another branch of Civil Aviation which in the next war may well prove much more valuable than that which at present they seem to consider the be-all and end-all of Civil Aviation. So let the sporting aviator and the sporting firms go to some other place where their presence will be welcome.

#### THE FLYING.

Apart from the weather and the drawbacks due to the bad placing of the public enclosures the Meeting was a distinct success in that it demonstrated the keenness and skill of the pilots. Unfortunately, owing to scarcity of orders in the trade, there were no really new machines to be seen. Also the handicapping was unusually bad with the result that there were no close finishes. Perhaps next time the R.A.C.C. Committee will forsake slide-rule handicapping and let a few practical aviators try their hands at allotting the starts.

The first race, the Club Handicap, brought out a field of ten starters, but only nine got away as the engine of Mr. Ingram's Avro choked itself and refused to go after being kept running for about a quarter of an hour while the start was delayed waiting for an air liner to get away. The distance was approximately 16 miles, but the times show that the competitors covered considerably more, probably because bad visibility prevented them from keeping an exact course.

The winner was Mr. R. H. Stocken, the Aircraft Disposal Co., chief pilot, on a D.H.9a (400-h.p. Liberty engine), who covered the course in 8 min. 52.2 sec. The machine had been turned into a single-seater, with the back seat stream-lined and all excesses removed. He had pushed it up to about 140 m.p.h. in a test the previous day, so the handicappers set him an easy task when they gave him 1 m. 10 sec. start from the two Martinsydes on the scratch mark.

Mr. C. D. Barnard on the De Havilland Co.'s D.H.9 "Sildcely (Puma)" was a good second in 10.32 3/5, with a handicap of 2 min. 28 sec. The third man was Mr. C. F. Uwins on a Bristol monoplane with a 3-cylinder 100-h.p. "Lucifer" engine.

This machine deserves special mention, as it is said that it is the original Bristol monoplane of the War type, built in 1916 or thereabouts. The "Lucifer" is the smoothest-running 3-cylinder engine that one has yet heard and it seems to give all the power claimed for it with a bit over. It ought to be an ideal engine for training machines as it is built of standard parts of the big Bristol "Jupiter" and so would make pilots familiar with the bigger engine to which they would progress later in their career.

The fourth man home was Mr. R. S. Carroll on an S.E.5a with a "Viper" engine. He had 54 sec. start from the Martinsydes and covered the course in 9 min. 19.5 sec. The fifth was Mr. Bert Hinkler on the Avro "Viper" (180-h.p. "Viper" engine) with Mr. F. P. Raynham in the front—the latter occupying that position as he said it was the only warm place on the aerodrome.

The sixth was Mr. H. O. Long on a Martinsyde (300-h.p. Suiza) whose time from scratch was 8 min. 48 sec.—the fastest time in the race. The seventh was Mr. W. H. Longton, on the other Martinsyde, who did 8 min. 56 1/5 sec. from scratch.

The eighth was that veteran sportsman Major Henry Petre, D.S.O., M.C.—known in the old days as "Peter the Monk"—who commanded in Mesopotamia the first squadron of the Australian Flying Corps which went to the War. His time on a Club Avro was 14 min. 43 3/5 sec. with 5 min. 40 sec. handicap. Ninth and last was Capt. A. F. Muir on the Disposal Co.'s dark horse, the Parnall "Panther" with a 200-h.p. Bentley Rotary. His petrol pump went wrong and he could never get full power out of his engine.

After the finish an incident occurred which might have been tragic but proved merely comic. Mr. Carroll on the S.E. 5a landed and wisely sat still waiting for the last machine to land. Mr. Long on the Martinsyde came in behind him and apparently did not see him, with the result that the Martinsyde ran straight up the fuselage of the S.E. Mr. Carroll, as usual very wide awake, saw the Martinsyde coming and jumped for his life, getting well clear before the collision occurred. The shock threw open the throttle of the S.E., which promptly tore its wrecked tail from under the Martinsyde and after a few wild gyrations stood gracefully on its head, leaving the Martinsyde kneeling on the remains of its own undercarriage.

As nobody was seen to descend from the up-ended S.E. naturally people thought that the pilot was hurt. The aerodrome ambulance dashed out, remained by the wreck for several minutes and then returned, giving the impression that it was conveying a corpse. And it was some considerable time before the crowd was informed to the contrary.

One suggests that aerodrome ambulances might carry flags to be flown while returning from a wreck by way of indicating their bag. For example black for a death, red for a serious

injury, green for a slight injury and white for "drawn blank." Perhaps the Department of Civil Aviation will consider the matter.

However, all was well that ended well. And the incident did at any rate lend excitement to the proceedings.

The second race was the Second Waddon Handicap, for machines doing not less than 100 m.p.h., four laps, about 32 miles. This was won by Mr. Hinkler on the Avro "Viper" in 21-10 4/5, off the 5.20 handicap mark. Mr. Uwins, on the Bristol monoplane, was second in 20-34, off the 4-11 mark. Mr. Stocken on the D.H.9a was third in 16.47, off the 4 sec. mark, and he also did fastest time.

The scratch man, Mr. Longton, was fourth in 17.06 2/5, on the surviving Martinsyde. And Mr. Barnard on the D.H.9 was fifth, doing 19-23 with a handicap of 1-53.

Mr. Muir gave up in the third lap owing to his defective petrol pump. And the Bristol's tank sprang a leak, so that she was withdrawn from the last race of the day.

The third race was the Second Croydon Handicap, for machines doing less than 100 m.p.h., three laps, about 24 miles.

For this there were only two starters, Major Petre (afore-mentioned) on an Avro, and a still greater veteran, Vice-Admiral Mark Kerr, C.B., M.V.O., on a B.E.2e, which looked a great deal more veteranish than he does. Admiral Kerr learned to fly on a seaplane in Greece in 1914, and he then admitted to being the oldest aviator flying, his age being 50 years. At that rate he must now be in his 59th year, which must be a record for an active pilot.

Major Petre won in 20-39 2/5 from scratch. Admiral Kerr, who handled his machine splendidly, did 21-24 3/5 with 3/5 sec. handicap.

After this finish the Admiral did quite a respectable landing, but bumped a bit and not feeling pleased with himself opened out his engine again and hauled the machine off the ground. The RAF engine, evidently resenting the demand for overtime, as a good Trade Unionist from the "Factory" should, choked itself and left the Admiral comfortably stalled about 20 feet from the ground. Whereupon the machine did the slowest possible flat spin, which looked like a purposeful turn, and then slipped onto its right wing. After which it stood on its nose leaving the Admiral perched up in the fuselage.

Half an hour afterwards he confessed to a stiff neck as the result of his somewhat abrupt stop, but otherwise he was unhurt. Altogether it was a fine sporting effort by one who has always been a sportsman.

After this Mr. Newell, the well-known parachutist, went up with Mr. Muir on an Avro and did a jump with a "Guardian Angel" parachute from about 1,500 feet and after descending some 500 feet cut himself loose with a second parachute. One parachute drop is a nasty sight and the double event is nastier still. It is true that it helps to emotion the crowd but it is not a healthy emotion, for right at the back of the mind of anyone who goes on purpose to see a parachute jump is the hope that some day the parachute will not open. If you deny this statement ask yourself honestly whether there would be anything spectacular in parachute jumping if it were absolutely certain that the parachute would open every time without fail. Really the Royal Aero Club ought to be above this form of sensationalism.

The fourth and last race of the day was the First Spring Handicap for machines in the first three in the previous races. Four laps, 32 miles.

There were only three starters, the Bristol having been withdrawn and Mr. Barnard not starting for some reason or other. Mr. Stocken on the D.H.9a was first in 16.26 1/5 from scratch. Major Petre on the Avro was second on 26-54, from a 9.36 handicap, and Mr. Hinkler was third in 21-47 1/5, from a 3-13 handicap. So even here, after three other races from which to correct the times, the handicapping was bad.

As an offset to the handicapping one would like to bear witness that the timekeeping by our old friend George Reynolds and that veteran long distance cyclist Mr. F. T. Bidlake was perfect. How they handle those queer figures quite defeats one.

After that, it being nearly 19.00 hours, one quit for home, being unable to support any longer the Arctic atmosphere. There was still some balloon sniping to be done, and Mr. Muir was to drop a dummy man with a new form of parachute. This is intended in case of a nose-dive to get away from the machine. The idea is, as was pointed out in this paper some years ago and as the Germans perceived during the war, that a machine with broken wings will fall as fast as a human body, so that if a man jumps out he will merely fall in company with his machine. Therefore it is necessary to pull him up and let the machine go ahead.

As one has not heard of Mr. Muir's death or manglement one assumes that the parachute worked and did not become tangled with his rudder or elevator. Or else it did not work at all and nothing happened, good, bad, or indifferent.

Considering all the disadvantages under which they laboured the Royal Aero Club Committee deserve to be congratulated on doing so well as they did. One hopes after

Whit Monday to be able to congratulate them on complete success, with perfect weather either in another place or in a considerably revised Croydon. The latter condition depends on whether the Department of Civil Aviation still considers that half-alive commercial flying is so immensely superior to one of the finest sports in the World.—C. G. G.

#### Notes on the Races.

Much of the success of the race meeting was due to the Aircraft Disposal Company, who put up the D.H.50a, two Martinsydes, the S.E.5a and the Parnall "Panther." They paid all the expenses of the D.H.50a and the "Panther," and in the cases of the two Martinsydes and the S.E.5a they arranged matters so that the pilots were put to the irreducible minimum of expense.

Therefore it was all the more gratifying to see Mr. Stocken win two races. His success is due to the efforts of Major Grant, Mr. Olney, Mr. Stocken himself, and a dozen or more keen mechanics who put in special time getting the machine fit, for the sheer love of sport.

#### THE ROYAL AERO CLUB.

The result of the Ballot for the nine vacancies on the Committee was declared as follows:—

Grp./Capt. F. W. Bowhill, C.M.G., D.S.O., R.A.F.; Major-Gen. Sir W. S. Branker, K.C.B., A.F.C.; Ernest C. Bucknall; G. B. Cockburn; Col. F. Lindsay Lloyd, C.M.G., C.B.E.; Lieut.-Col. J. T. C. Moore-Brabazon, M.C., M.P.; Lieut.-Col. Mervyn O'Gorman, C.B.; Air/Com. C. R. Sanson, C.M.G., D.S.O., A.F.C., R.A.F.; and Sir A. Mortimer Singer, K.B.E.

ELECTION OF PRESIDENT, VICE-PRESIDENT AND COUNCIL.

The following were unanimously elected:—

PRESIDENT.—Brig.-Gen. the Duke of Atholl, K.T., M.V.O., D.S.O.

Everyone sympathised with Mr. Carroll and Mr. Long, and one hopes that by now the latter has cheered up a bit. Anyway, after he had ascertained that neither of the pilots was hurt, and after he saw Mr. Stocken win the race Major Grant grew every minute and in every way pleaser and pleaser.

When Admiral Kerr had discontinued his flight in that gentle yet rather sudden manner one person remarked that it might have been a case of "Kerr is going West, Lads," and he at once thought out a song which he called "The Admiral's Crash." However the gallant Admiral's co-optimism was such that instead of saying, "I must go down to the sea again," he leapt into an Avro and destroyed three balloons in four shots just to show he didn't care.

There were many faces once familiar at the aerodrome and among other old pilots one saw Mr. Donald Lindley and "Bill" Lawford, late of A.I. and T. Sir Sifton Braucher beamed forth from his "covey" and many other erstwhile officers of the R.A.F. were to be seen.—G. D.

VICE-PRESIDENT.—Viscount Northcliffe.

COUNCIL.—S.A.I. Prince Roland Bonaparte; the Earl of Hardwicke; the Earl of Lonsdale; Admiral of the Fleet the Earl Beatty, G.C.B., O.M., G.C.V.O., D.S.O.; the Rt. Hon. Lord Hugh Cecil, M.P.; the Lord Howard de Walden; the Lord Kninraid, K.T., F.R.G.S., D.L., J.P.; the Lord Montagu of Beaulieu, C.S.I.; Admiral of the Fleet the Rt. Hon. Sir Edward Seymour, G.C.B., O.M., G.C.V.O.; Admiral the Hon. Sir Edmund Fremantle, G.C.B., C.M.G.; Count Henry de la Vaulx; Sir David Salomon, Bart.; the Rt. Rev. Bishop Well-Don; Martin Dale; Andre Michelin; Sir Basil Zaharoff, G.B.E., G.C.B.; and Air-Marshal Sir Hugh M. Trenchard, Bart., K.C.B., D.S.O.

#### SIR ROSS SMITH.

On April 13th Sir Ross Smith, flying the Vickers "Viking" amphibian biplane on which he was to have made the attempt to fly round the World, was killed at Brooklands along with his chief mechanic, Mr. Bennett, who had accompanied him on the Australian flight.

On the previous day a reception had been held by the Aviation Department of Vickers Ltd., when representatives of the Press were afforded an opportunity of seeing the machine and of wishing good luck to the enterprise. Sir Ross Smith then explained his plans to those present and all of us who were there were immensely impressed by the thoroughness with which he had gone into all the details of his great task. If ever a man deserved success he did. It is surely the irony of fate that he should have been killed just when everything seemed to promise him still greater success.

It appears that the "Viking" was taken for its first flight on the morning of the 13th by Captain Cockerell, who flew it for half an hour or so, the machine behaving perfectly. Sir Ross Smith then took it up with Mr. Bennett as passenger. So far as one can gather he had made three or four flights previously on "Vikings" of the earlier pattern with Captain Cockerell or Captain Broome to show him the ways of the type, which naturally differs materially in handling from the big twin-engined "Vimy" on which most of his flying has been done in the past four years.

After flying faultlessly for about a quarter of an hour over the district round Brooklands he started to come in to land, with the engine throttled down. At a height of approximately 800 feet the machine got into a spin. An experienced eyewitness says that Sir Ross opened up his engine evidently with the idea of getting the machine under control, and then shut it off again when near the ground. He appeared to be just on the point of regaining control when the machine struck.

The only possible explanation of the accident seems to be that in gliding down to land he slowed down too much and stalled the machine on a turn. A spin would be the natural result.

In a machine of the flying-boat type, as the "Viking" is, the control with the engine off is not so good as with the engine on, when the whole tail unit is directly in the slipstream. Moreover, with the engine placed high up as it is the engine thrust tends to push the nose down, and consequently when the engine is shut off the machine tends to be tail-heavy. All of which increase the tendency to spin if the machine is stalled, and so make a longer drop necessary in which to regain control. Also certain types of high-lift wing have a tendency to stall suddenly without preliminary "sogginess."

These are aerodynamic characteristics of the type which cannot be avoided, and aeroplanes designed on such lines—as they must be for certain definite purposes—have to be handled accordingly. It is natural that a pilot who is used to a big lightly-loaded machine should make mistakes at first on a type so entirely different.

The tragedy is that so experienced a pilot as Sir Ross Smith

should have made that one little error just when it was too late to recover from the consequences. Yet in the history of aviation there are all too many similar tragedies caused by just such simple errors of judgment. The deaths of Major McCudden and Sir John Alcock are only two cases in point among many.

Personally Ross Smith was a man who won the respect and affection of all who met him. He first made a big name for himself as one of the two Handley Page pilots who during General Allenby's last great attack in Palestine bombed Turkish Headquarters and so broke up the Turkish telegraph system that the Turks were unable to send orders in time to their forces on the west flank to hinder the great cavalry turning movement. Later on, after the Armistice, he went with General Borton to survey the route to Australia. His flight to Australia with his brother Keith Smith is a matter of history.

Perhaps the most striking characteristic about Ross Smith was his modesty. Few men with such achievements to their credit and with so many honours showered upon them would remain as he did, and as his brother does, so entirely unspoiled by fame and popularity. Such modesty is the mark of the truly great man to whom fame comes as a right and not as an accident which takes him by surprise. Had he lived he would have gone far.

One who knew him well and had worked with him for many months remarked only the day before his death that Ross Smith did not know what fear was but that he took no chances. That was the secret of all his successes. He prepared for everything, he foresaw all the risks he had to take and provided against them, and when in a tight corner he kept his head. That such a man should be killed in a mere aerodrome accident makes the tragedy all the greater.

Ross Smith and his friend Bennett deserve to rank with the great pioneers and the great martyrs of aviation. In them we have lost two of the best of the many good men whom Australia has produced for the glory of the British Empire. To Sir Keith Smith one offers all sympathy in the loss of his gallant brother and his faithful friend.

To one's own friends in the Aviation Department of Vickers Ltd. also one extends sincere sympathy in the loss of two men with whom they have worked so closely and so enthusiastically for these many months with the object of accomplishing the greatest feat yet attempted in the progress of aviation. The loss of all their work and the defeat of their fondest hopes is a cruel blow, but one knows that it is all as nothing to the sorrow they feel at the deaths of the men whom in those months they had learned to know and value at their full worth.

All progress is made over the graves of pioneers. The aeronautical community has the consolation of knowing that others will carry on the work which Ross Smith began. But when the object which he had in view is achieved we shall still realise that no better man than Ross Smith has achieved it.—C. G. G.



## R.A.F. INTELLIGENCE.

## R.A.F. Appointments.

AIR MINISTRY, April 17th.

Air/Comdr. H. R. M. Brooke-Porham, C.B., C.M.G., D.S.O., from H.Q., Inland Area, to R.A.F. Staff College, as Commandant 1/4.  
 Air/Comdr. R. H. Clark-Hall, C.M.G., D.S.O., from Air Pilotage School (Cadre) to R.A.F. Staff College, for duty as Instructor. 1/4.  
 Wing/Comdr. P. B. Joubert de la Ferté, C.M.G., D.S.O., from Air Pilotage School (Cadre) to R.A.F. Staff College, for duty as Instructor. 1/4.

Wing/Comdr. W. R. Freeman, D.S.O., M.C., from Air Pilotage School (Cadre) to R.A.F. Staff College, for duty as Instructor. 1/4.  
 Wing/Comdr. C. H. K. Edmunds, D.S.O., O.B.E., from Air Pilotage School (Cadre) to R.A.F. Staff College, for duty as Instructor. 1/4.  
 Wing/Comdr. A. T. Whitelock, from H.O., R.A.F., India, to R.A.F. Depot. (Superannuary.) 2/3, to join 1/5.

Wing/Comdr. J. Mead, C.B., D.S.O., from R.A.F. Depot to I.A.A.D. 27/3.  
 Wing/Comdr. J. E. A. Baldwin, D.S.O., O.B.E., from No. 7 Group H.Q. to R.A.F. Staff College. 3/4.  
 S/Ldr. B. E. Sutton, D.S.O., O.B.E., M.C., from Air Pilotage School (Cadre) to R.A.F. Staff College, for duty as Instructor. 1/4.

S/Ldr. G. S. M. Insall, V.C., M.C., from No. 6 F.T.S. to R.A.F. Depot. (Superannuary.) 1/4.  
 S/Ldr. K. F. S. Morton, from Inspector of Recruiting (Liverpool) to No. 2 F.T.S. 3/4.

S/Ldr. A. S. Morris, O.B.E., from No. 6 F.T.S. to No. 1 F.T.S. 1/4.  
 S/Ldr. R. S. Maxwell, M.C., D.F.C., from Air Ministry (Directorate of Training and Organisation) to R.A.F. Depot. (Superannuary.) 1/4.

F/Lt. C. B. Dick-Cleland, from Air Pilotage School (Cadre) to R.A.F. Staff College, for duty as Adjutant. 1/4.  
 F/Lt. C. H. Field, from No. 1 Wing H.Q. (India) to R.A.F. Depot (Flying Wing) (Cranwell), for duty as Instructor in Aerial Navigation and Pilotage. 15/4.

F/Lt. F. Tedman, M.B.E., from R.A.F. Depot to R.A.F. Base, Gosport. 4/4.  
 F/Lt. J. Roberts, from H.O. (I.A.) to R.A.F. Depot. (Superannuary.) 1/4.

F/Lt. E. Meynell, D.C.M., from R.A.F. Depot to H.O. (I.A.). 1/4.  
 F/Lt. H. S. Shield, M.C., from R.A.F. Depot to Armament and Gunnery School. 3/4.

F/Lt. G. C. Bailey, D.S.O., from C.F.S. to School of Photography. (Superannuary.) 3/4.

F/Lt. H. G. P. Rees, from No. 1 Wing H.Q. (India) to R.A.F. Depot. (Superannuary.) 23/2, to join 1/5.

F/Lt. C. Fox-Pitt, to R.A.F. Depot. (Superannuary.) On attachment from Army. 8/3.

F/Lt. C. E. H. James, M.C., from school of Photography to No. 1 F.T.S. 2/4.

F/Lt. W. S. Caster, M.C., from No. 6 F.T.S. to No. 21 Sqn. 28/3.  
 F/Lt. C. Musgrave, A.F.C., from No. 6 F.T.S. to No. 100 Sqn. 31/3.

F/Lt. H. M. K. Brown, from No. 6 F.T.S. to No. 39 Sqn. 31/3.  
 F/Lt. A. S. Maxwell, from Inspector of Recruiting (Forthmouth) to R.A.F. Depot. (Superannuary.) 1/4.

F/Lt. N. Keeble, D.S.C., D.F.C., from No. 6 F.T.S. to R.A.F. Depot. (Superannuary.) 1/4.

F/Lt. A. H. Wain, from R.A.F. Airship to H.Q. (C.A.). (Superannuary.) 24/2.

F/Lt. A. J. Braddon, from R.A.F. Depot to H.Q. (C.A.). 3/2.

F/Lt. A. J. Card, from R.A.F. Cadet College (Ground Wing) (Cranwell) to H.O., R.A.F., Cranwell. 3/4.

F/Lt. L. N. Hollinhurst, D.F.C., from R.A.F. Depot to R.A.F. Cadet College (Ground Wing) (Cranwell). 31/3.

F/Lt. A. C. Snow, from R.A.F. Depot to No. 11 Wing, H.Q. 31/3.  
 F/Lt. L. H. Slatter, O.B.E., D.S.C., D.F.C., from Half-pay List to No. 20 Sqn. 1/3.

F/Lt. H. O. Long, D.S.O., from Instrument Design Establishment to Aeroplane Experimental Establishment. 15/4.

F/Lt. H. E. P. Wigglesworth, D.S.C., The notification which appeared wherein this officer was posted from R.A.F. Depot to I.A.A.D., with effect from 20/3/22, is hereby cancelled.

F/Lt. J. H. Hagon, from R.A.F. Depot to School of Photography. 18/4.  
 F/Lt. J. M. McEateart, from Air Ministry (Director-General of Supply and Research) to R.A.F. Depot. (Superannuary.) 1/4.

## Night Flight between Croydon and Lympe.

The following announcement is made by the Air Ministry: The first flight by night over the British portion of the Continental Air Route (Paris, Brussels, Amsterdam, etc.), was carried out on Wednesday night (April 5th) by an Air Ministry machine in order to test the ground organisation which has been established for commercial flying by night between London and the Continental capitals.

The aeroplane, which carried eight people, including a Navigator, Wireless Officer, and two Air Ministry officials responsible for the lighting and wireless arrangements of the route, left Biggin Hill about 8.30 p.m., flew to the London Terminal Aerodrome, Croydon, and landed there. The pilot in charge, who has had great experience, expressed the view that the flood lighting arrangements on the aerodrome by means of dispersed searchlight beams, together with the illuminated landing "Ls," were the best he had seen and made landing as easy by night as by day.

The aircraft left Croydon Aerodrome about 9.20 p.m. and steered a direct course for Lympe Aerodrome on the coast. Temporary aerial lighthouses were in action at Tatsfield and at Cranbrook, and these were easily picked up. Shortly after passing the Cranbrook Light the Pilotage Light on Lympe Aerodrome became clearly visible. The machine then flew over Lympe Aerodrome and continued over the Channel towards St. Inglevert, the first aerodrome on the French side.

The Marine Lighthouses at Cap Gris Nez, which had been visible as soon as the aircraft was over Biggin Hill, gave an excellent leading mark and very soon the French Aerial Light-house on St. Inglevert Aerodrome also came in sight. Turning back on its course the aeroplane then crossed the coast near Folkestone and headed direct for the Pilotage Light at Lympe, at which aerodrome an easy and smooth landing was effected. Leaving this station at about 11.30 p.m. a course

was retraced to Croydon, the lights of the Terminal Aerodrome being easily picked out from all the mass of lights of Croydon and London generally. After circling Croydon Aerodrome the aircraft was headed for Biggin Hill, where a landing was effected with the help of wing tip flares and ground flares.

The general impressions of those who made the flight were that it is easier to find a course by night than by day and that provided the Continental ground organisation is as good as our own there should be no difficulty whatever in commercial night flying over the London-Paris route.

[One suggests that when the Air Ministry has made it safe to fly by day it will be time to expend time and petrol on experiments in flying by night.—Ed.]

## An Incident at Malta.

On March 28th a flying-boat of 267 Squadron, R.A.F., set out from Malta for Palermo, W. Sicily, but, owing to engine trouble, landed near the mouth of the River Mazaro. The commander of the port of Mazarra, observing that the flying-boat was in difficulties and was gradually being blown towards the rocks, placed himself in command of two boats and 15 volunteers and succeeded in towing the boat safely into the river. On the following day another boat from Malta arrived with spares and later they both returned to Malta together.

In their short sojourn in Mazarra the crew of five were shown the greatest hospitality on the part of the local dignitaries and citizens.—L. B.

## W.R.A.F. Old Comrades' Association.

The annual general meeting of the O.C.A. was held on April 28th at Birbeck College, Dame Helen Gwynne Vaughan, President of the Association, was in the chair. About 250 members were present. In the course of her report the President said that the Association had not yet become affiliated with the British Legion because under the present constitution of the Legion they can only offer former members of the W.R.A.F. membership of the Women's Section, which consists mainly of the dependents of service men. Dame Helen said that she considered that the members of the O.C.A. should at least equal in the British Legion "men who have served not less than seven days with the colours." She said that the British Legion had this under consideration, and in the meantime the W.R.A.F. O.C.A. will wait for their decision. Her announcement had the unanimous support of the meeting.

## The Zebrugge Dinner.

The annual Zebrugge dinner will be held at the Café Royal on the eve of St. George's Day, April 22nd.

All R.A.F. officers who took part in the operations leading up to and culminating in the attacks on Zebrugge and Ostend are invited to be present: tickets one guinea each.

Any officers who have not yet received notification and who wish to attend should communicate with Air/Comdr. C. L. Lamb, Air Ministry.

## R.A.F. SPORTS AND PASTIMES.

## R.A.F. Club Dances.

The following arrangements for forthcoming dances at the Club have been approved by the Committee:—

Friday, April 21st.—21.00 to 02.00 hrs. Tickets, 10s. 6d.

Friday, May 5th.—21.00 to 02.00 hrs. Tickets, 10s. 6d.

Friday, May 19th.—21.00 to 02.00 hrs. Tickets, 10s. 6d.

Wednesday, May 31st (Derby night).—22.00 to 03.00 hrs. or later. Tickets, 15s.

The price of the ticket includes buffet supper, iced coffee, etc.

The House Dinner will be at the usual price, except on Derby Night, for which night the price is to be decided.

The number of dance tickets will be limited to 200.

It is considered wise to discontinue the Dances during the summer months of June, July, August and September.

## R.A.F. Boxing Championships.

The annual individual boxing championships of the R.A.F. were fought at Uxbridge on April 6th and 7th. The results were:—

Middle Weights.—First Series.—F/O. H. J. Dann (Hendon) beat F/Lt. E. E. Porter, M.B.E., D.C.M. (Flowerdown), in the first round.

OTHER RESULTS.  
 Fly Weights.—First Series.—A.C. J. Izzard (Uxbridge) beat A.C. Minto (Hendon) on points; A.C. Lawler (No. 1 F.T.S.) beat I/A.C. Warren (Cushiball) on points; A.C. Goodman (Leuchars) (holder) beat A.C. Millington (Hendon), who retired in the first round.

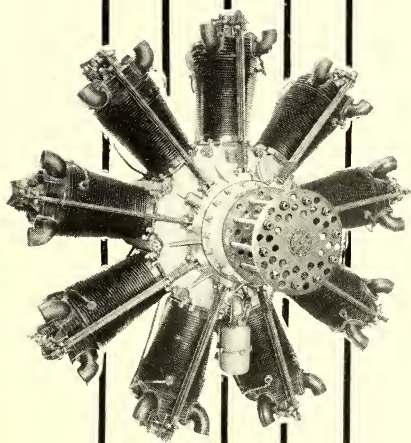
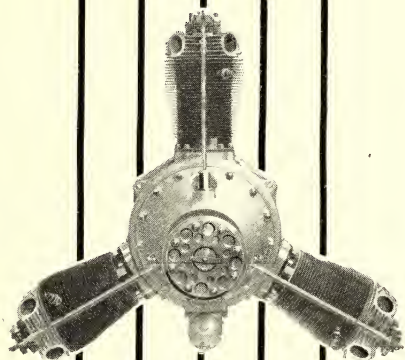
Bantam Weights.—First Series.—I/A.C. W. Ballantyne (Leuchars) beat A.C. Whittaker (Hendon) on points; A.C. Smith (Ruislip) beat A.C. Williams (Cushiball) in the 2nd round; A.C. Davis (Hendon) beat A.C. Alexandra (Hendon) in the 2nd round.

Feather Weights.—First Series.—A.C. Borland (Isle of Grain) beat A.C. Cox (Hendon) on points; A.C. Woods (Cushiball) (holder) beat A.C. Uxbridge absent; A.C. E. Griggs (Henlow) beat A.C. H. Woolf (Cranwell) on points; A.C. Jackson (Hendon) beat Cpl. Glover (Henlow) in the 1st round; I/A.C. Barnes (Henlow) beat Cpl. Chesbit (Shrewsbury) in the 1st round; A.C. Aarons (R.A.F. Records) beat A.C. Campbell (Manton) on points.

Light Weights.—First Series.—A.C. Page (Hendon) beat Cpl. Abbott (Hendon) on points; Cpl. Salter (Hendon) beat A.C. D. Flynn (No. 6

(Continued on page 287.)





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**100 h.p. LUCIFER**

**Aero Engines are the only aircooled aero engines which have ever satisfied the requirements of the British Air Ministry Type Test Schedule and been approved for Airworthiness Certificate.**

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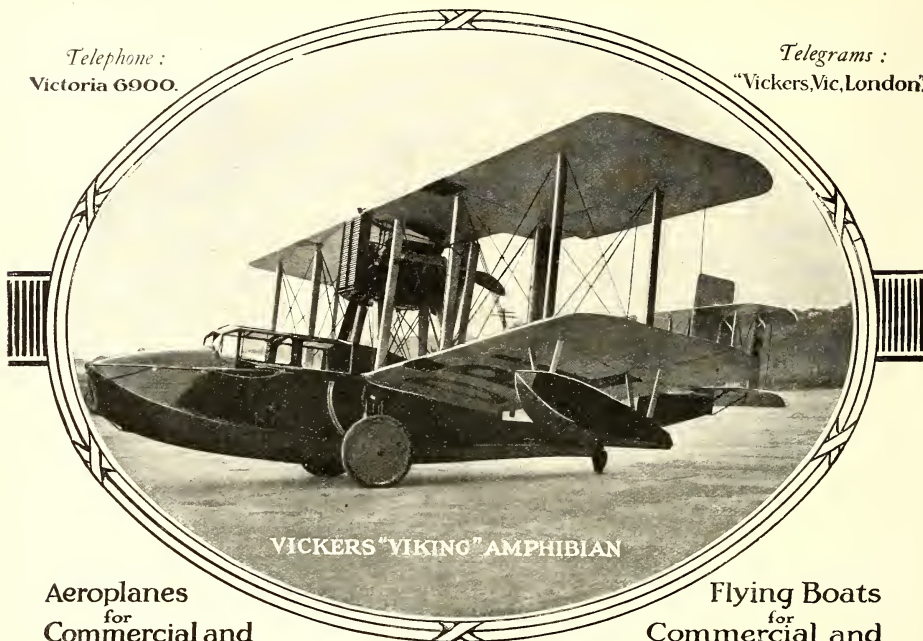
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tions at the INTERNA-  
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1. Shortest time in "un-  
sticking" from water.
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3. Climb to 1,000 metres.
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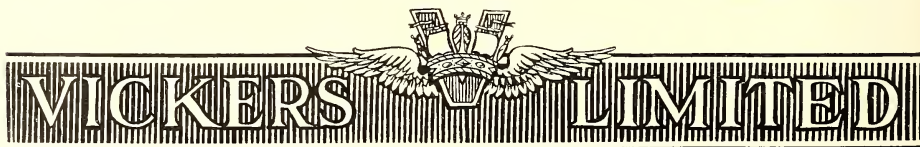
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6 Passengers and  
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INCORPORATING AIRCRAFT ENGINEERING, AERODYNAMICS, AIRCRAFT FINANCE AND COMMERCIAL AERONAUTICS AND MATTERS PERTAINING TO THE AERONAUTICAL ENGINEER AND THE AIRCRAFT TRADER.

## THE WEEKLY COMMENTARY.

The general conclusions of a recent paper read by M. Louis Breguet before the Royal Aeronautical Society are given below. It will be noted that M. Breguet attaches the same importance to possible improvement in the aerodynamic efficiency of aeroplanes as did Capt. Sayers in his recent articles.

A detailed description of the new twin-engined Handley

Page passenger machine is given in this issue. This type of machine—a modification of the original W.8—has many interesting constructional features and is amongst the most efficient and modern of twin-engine types.

An account of the proceedings at the Nice Aviation Meeting, written by "C. G. G.," will be found on pages 283 and 285.

## M. BREGUET ON THE REDUCTION OF AIR TRANSPORT COSTS.

M. Louis Breguet, the well-known French aircraft designer, on Thursday, April 6th, read a paper before the Royal Aeronautical Society on the effect of aerodynamical efficiency on the cost of air transport.

The bulk of the paper consists of a fairly simple mathematical analysis of the effect of improving the "fineness" or, in more English terms, the lift to drag ratio of an aeroplane. Readers of this paper should by now have a fairly sound knowledge of this subject, and although the form of M. Breguet's argument is different, the substance of it and the general conclusions at which he arrives are precisely similar to those which have been expressed very recently by Capt. Sayers.

M. Breguet takes as an example a modern aeroplane of high standard quality with a "fineness" of 0.12 (roughly a gliding angle of 1 in 8), a service ceiling of about 4,500 metres, 100 square metres of surface, 600 h.p., a total weight of 4,500 kilograms, and disposable load of 2,200 kilos. This machine would have a top speed of 175 kilometres per hour at 2,000 metres, and its cruising speed would be 150 k.m.h. For an 800-kilometre stage M. Breguet allows 850 kg. for fuel and oil, 250 for crew, instruments, and wireless, leaving a margin of 1,000 kg. for paying cargo.

He then shows that the cost for an 800 km. stage at prices current in France would be 17.4 francs per kilometre flown. Allowing for half full load as average cargo the cost per ton kilometre is then 35 francs (about 55s. per ton mile at par and somewhere about £5 per ton mile at present rate of exchange).

Assuming that the "fineness" of the machine can be improved to 0.005 (a gliding angle of about 1 in 15), and that airscrew efficiency can be slightly improved, the machine will now only require 286 h.p. to reach the same ceiling. Owing to the saving in weight of engine, the reduced fuel consumption, and assuming that by the time the aeroplane has been so improved the economy of aero engines will also have been improved to the extent of some 25 per cent., M. Breguet shows that the same-sized aeroplane will be able to carry very nearly 2,000 kilos of paying load.

The new aeroplane will cost less than the first because its engine is smaller, and the running cost of the new type will come down to 14.6 francs per kilometre. For half-load the cost per ton kilometre is now 14.8 francs instead of 35.

Having dealt with the effects of aerodynamic improvements M. Breguet proceeded to consider the advantages which would result from improvement in engines and aeroplanes such as would reduce the maintenance and repair costs. He said: "When one can rely on an average life of 1,000 hours for aeroplanes and engines instead of the present 200 or 250, sinking fund, upkeep, and general expenses of operation will

be considerably reduced." Under those conditions M. Breguet estimates that a machine aerodynamically the same as that already considered could be run at a cost of 5.54 francs per kilometre or 5.05 per ton kilometre. An average of half-load corresponds to a cost per passenger between London and Paris of 100 francs, say £4. This latter change is entirely due to a reduction in sinking fund (depreciation), repair and maintenance, and administrative expenses.

M. Breguet states his opinion that it is not the cost of fuel or crew which makes aeroplanes expensive machines, but only their present short life.

If the figures which he gives allowing for the writing off of complete aeroplane and engine after only 250 hours of flight are representative of French experience in the operation of commercial machines, one must entirely agree with him, but his figures certainly do not apply to modern British aircraft.

Equally, if his figures of present operating costs are representative of French experience, it would appear to be fairly certain that a machine combining the running costs of standard French types with the durability of standard English types would suffice at once to make air transport a paying proposition.

However, these particular criticisms do not affect the soundness of M. Breguet's general conclusions, which are that very considerable improvements in aircraft, both in regard to their aerodynamic efficiency and to their structural robustness and durability, are not only necessary but are perfectly possible in the very near future, and that when these improvements are once realised the air transport business is going to be a very important and a very profitable one.

## THE ROYAL AERONAUTICAL SOCIETY.

The following preliminary programme of lectures for next session has been arranged:—

Nov. 2nd.—Major A. R. Low, Fellow, "A Review of Air-screw and Helicopter Theory, with Aeroplane Analogies."

Nov. 16th.—Mr. R. McKinnon Wood, A.M.Inst.C.E., Fellow, "The Co-Relation of Model and Full Scale Work."

Dec. 7th.—Professor C. P. Jenkin, C.B.E., Fellow, "Fatigue in Materials."

1923.—Feb. 15th.—Wing Commander T. R. Cave-Browne-Cave, C.B.E., Fellow, "The Practical Aspects of the Sea-plane."

March 1st.—Major F. M. Green, Fellow, "Helicopters."



## THE HANDLEY PAGE W.8b.

The Handley-Page W.8b which is to be used on the Handley-Page service during the coming summer is a modification of the well-known W.8, a machine produced some considerable time ago, and used so largely for experimental purposes. The W.8 was, one believes, the first twin-engine machine that was designed for passenger carrying purposes, and it has shown itself to have so many good qualities that the new machines, which are now on the point of completion, are aerodynamically at least practically unaltered from the original model.

The original machine was fitted with two Napier "Lion" engines, each of 450 h.p., which gave the machine a distinctly high performance. Experience however seems to have convinced the Handley Page Company that the margin of power given by this installation was unnecessary, either for the sake of reliability or to maintain a high average of punctuality in their service. In this belief they have been confirmed by the very satisfactory service given by the old converted O/400 type, and the W.8bs are to be fitted with the same power-plant as that found to be adequate for the older and less efficient machines—that is, two Rolls-Royce "Eagles" of 360 h.p. each. Before deciding upon the production of the new type tests were made on the original W.8 with the engines throttled down to give the same h.p. as that of the proposed installation, and the results of this test show that the machine in its modified form will not suffer from lack of power.

The top speed was 103 m.p.h., the cruising speed 90 m.p.h., and the machine climbed to 2,000 ft. in a fraction over four minutes, carrying pilot, mechanic, and 16 passengers—a total loaded weight of 12,000 lbs. This weight corresponds to the normal full load for which the type is designed, and this will include crew, 3½ hours' fuel, 12 passengers and 880 lbs. of goods.

In the design of the W.8b great attention has been paid to details making for reliability, safety and the comfort of passengers. Very little change has been made in the structure, the engine mountings alone are appreciably altered. Details of this mounting are shown in a sketch. The whole structure is composed of steel tube, and the engine is overhanging ahead of the main planes. Only the oil tanks are carried in the engine nacelle, and the cowling is very short, scarcely extending past the leading edge. Each engine has a petrol tank of 100 gallons capacity, mounted on the top plane, giving a direct gravity feed.

Exhaust silencers, of the R.A.E. long tube type are fitted to the engines.

The arrangement of the saloon has been somewhat altered from that of the original W.8. Twelve seats are provided, in two rows, and there are light racks for hand luggage. The amount of leg room given to the passengers seems unusually ample, which is a very important point making for comfort.

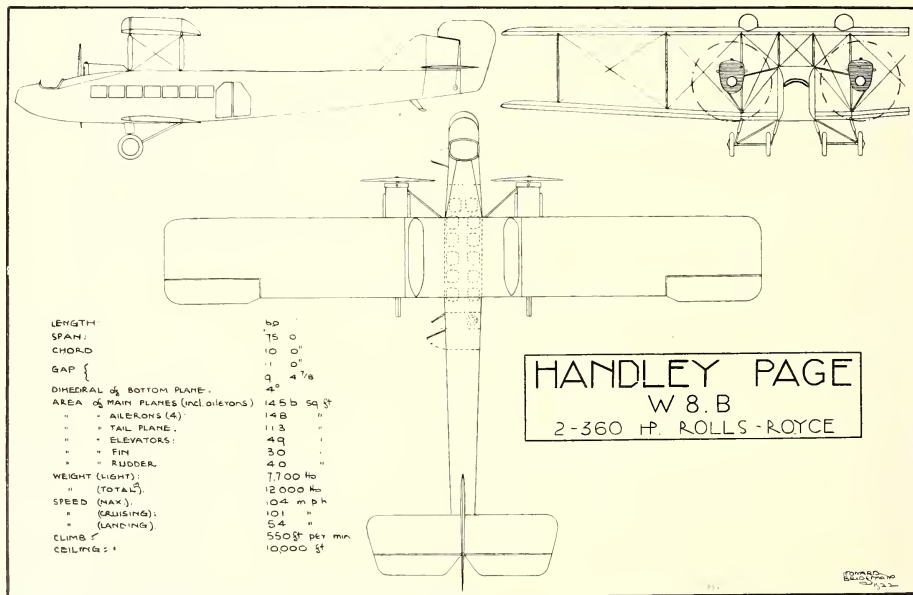
Heavy luggage is carried in two compartments, one between the saloon and the pilot's seat, and another behind the saloon. There are separate entrances to each of these baggage rooms. There is a way through the fore baggage space from the saloon to the pilot's cockpit. Adequate ventilators are fitted to the roof of the cabin, and in addition every alternate window may be opened.

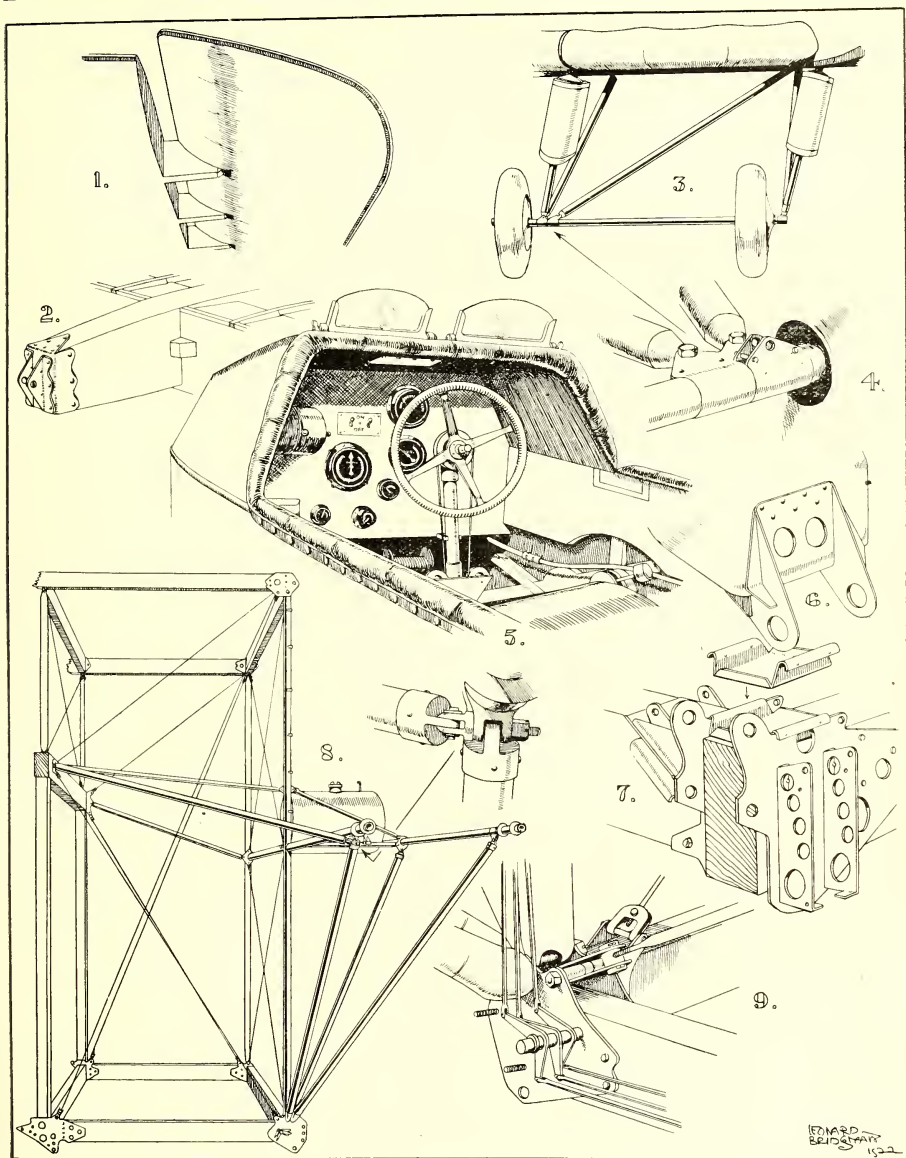
One unexpected change in the new type is that folding wings are not fitted, on the grounds, one gathers, that at properly equipped terminal aerodromes folding is not required, and that if one has to land elsewhere, where folding wings might be advantageous, the personnel necessary to carry out the operation is not usually available.

A number of details are shown in the attached plate of sketches. Fig. 1 shows the type of aileron balance used. Three main ribs at each wing-tip are carried aft of the rear spar and the ailerons are hinged at a point well inside the leading edge, thus giving a balanced portion along the entire length of each aileron. Fig. 2 shows one of these rib stub ends.

The undercarriage is in two parts and consists of four steel tube Vees mounted one under each engine and one under each outer edge of the fuselage, the front and rear legs being attached at points in line with the main spars. The front legs are fitted with rubber shock absorbers of the usual pattern, and these are fitted with metal streamline casings. One side of the undercarriage is shown in Fig. 3, and this indicates clearly the general assembly. It will be noted that one steel bracing tube takes the place of the more usually fitted wire bracing. Fig. 4 shows in closer detail the axle attachments of the outer Vee and the transverse tube, the front leg having been omitted to show the fitting more clearly.

The pilot's cockpit is situated in the nose and contains the pilot's seat fitted on the right side, with a tip-up seat alongside for the use of a mechanic should one be carried. The following equipment is provided:—Wireless apparatus, two air-speed indicators (one in cabin), two altimeters (one in cabin), clinometer, two revolution indicators, two radiator





thermometers, two oil-pressure gauges, two petrol level gauges, two oil thermometers, and two Pyrene extinguishers (one in cabin).

The main planes are of normal construction and are fitted with two sets of struts on either side of the engines. Fig. 6 shows the strut-end fitting, which when in position is encased with metal sheathing to carry the lines of the strut right up to the plane surface.

The engine mounting is of steel tube construction and is shown clearly in Fig. 8. The engine bearers proper are in advance of the front struts and are supported by three bracing tubes running up from the bottom main spar fitting, as well as by two cross tubes from the top longeron of the fuselage.

An oil tank of 6½ gallons capacity is provided in the rear of each engine. Fig. 9 shows the bottom main spar fitting under the port engine, with the engine control rocker arms. Fig. 7 is a detail in the fuselage construction and shows a fitting at a point in line with the front main spar, where the nose portion of the fuselage joins the front of the cabin. The small aluminium plate is provided to take the pressure of the upright member and prevent it crushing the grain of the transverse fuselage member. The tail plane is of the monoplane type, and all control surfaces, with the exception of the elevators, are balanced.

The general arrangement of the machine and the specification is shown in the attached scale drawing.

EDWARD  
BRIDGMAN  
1922

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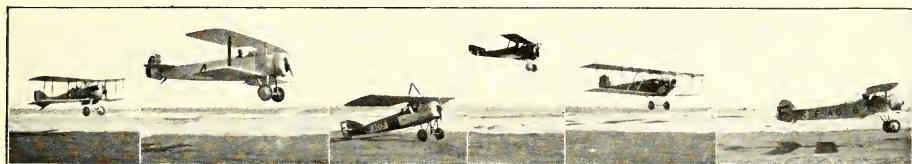
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## THE NICE MEETING.



CAUGHT IN THE ACT.—Some performers landing on (Nieuport), Hlâchaire (Spad), a Morane Parasol, Coppens

the Californie Aerodrome. Left to right: Sadi Lecoq (Hanriot), Brack-Papa (Fiat), and another Spad

TAKING it all round, the Nice Aviation Meeting was quite an amusing little affair, though it fell a long way short of being as emotioment as the preliminary notices promised, and was far from being of the practical value of the Monaco seaplane meetings in years gone by. Imagine, if you please, a miniature Royal Air Force Pageant—such, for example, as that so admirably staged by No. 23 Squadron at Hawkinge last year—spread over three afternoons, and you have a fair idea of the performance. The good people of the *Aéro-Club de la Côte d'Azur*, locally known as the A.C.C.A., took the affair very seriously and some thousands of people paid sums varying between 5 and 20 francs to be allowed on the famous *Promenade des Anglais* to see the show.

Incidentally the *Promenade* was the only thing Anglais about the Meeting. So far as one can discover, no English pilots were invited, though the Italian and Belgian representatives had all expenses paid for themselves and their mechanics and their machines, and the French trade pilots received a liberal fee for appearance as well as the chance of winning quite hand-some prizes.

Judging by one's personal experiences, the English are not popular with the A.C.C.A., despite the fact that the Côte d'Azur, which we generally call the Riviera, owes most of its prosperity to British money. At any rate, one wrote before the Meeting to the "Commissaire-Général" asking for the courtesies which are usually extended to the Press in most countries on most occasions, and received no reply.

On the first day of the Meeting, Sunday, March 26th, one called at the office of the A.C.C.A. and was told by a M. Bernard, the organiser of the show, that nobody was allowed on the Californie Aerodrome except pilots, mechanics, and guards. Which would have seemed reasonable if one had not known that French and Italian journalists and photographers and numerous officials and the feminine belongings of all of them were allowed into the aerodrome. However, one was not inclined to make a fuss, and one would have been content to ignore the whole affair but for the fact that a certain ex-officer of the W.R.A.F., a resident at Monte Carlo, who was of our party, promptly burst into flames of wrath, dashed into the office and demanded of a secretary person what the A.C.C.A. meant by it.

The secretary explained to the irate lady that M. Bernard had gone to lunch and had without doubt committed a grave error. Thereupon he went to M. Bonvallet, an official of the Meeting and a big man in the automobile trade in Nice.

M. Bonvallet, the essence of courtesy, put himself to a great amount of trouble on our account and discovered M. Edouard Muscat, a notable advocate of Nice, another official of the Meeting, who also displayed that courtesy to which one was accustomed in France before the war and conveyed our party of three to the aerodrome, where he introduced us to M. Raymond Saladin of *L'Auto*, the highly efficient Director-General of the aerodrome end of the proceedings.

On returning from the Meeting that evening one wrote again to the Commissaire-Général asking only for Press tickets which would admit us to the aerodrome the next day of the Meeting, Thursday. This letter was also ignored, though according to precedent in this country and in pre-war France (as for example at the various Monaco Meetings) one should have received not only Press tickets but invitations to the various official functions connected with the Meeting.

Consequently on the Thursday we were again obliged to inflict ourselves on the kindly M. Bonvallet, who this time took us, a party of four, to the aerodrome in one of his own cars. Before leaving there that day one took the precaution of obtaining a signed pass from M. Raymond Saladin, so on the third day—the following Sunday—we cut out the A.C.C.A. office altogether and went direct to the aerodrome, where all was well.

Therefore one takes this opportunity of acknowledging publicly the kindness and courtesy of MM. Muscat, Bonvallet, and Saladin. May they become respectively the greatest advocate, the greatest automobile dealer, and the greatest journalistic power in France—or at any rate on the Côte d'Azur. But, as for the Aero Club of the Côte d'Azur—*à bas l'A.C.C.A.!*

One has said that there was nothing Anglais about the Meeting itself. There was not. But it was otherwise in another way, for one of the best friends of British Aviation among European Nations, who was there, told one a sad story of an Englishman who had evidently once been in the R.A.F. and was then existing in Nice. This fellow, it appears, dug out a dusty and faded blue uniform and duly paraded himself at all the official functions—to which, as already stated, *bona fide* representatives of British Aviation were not invited. And there, as our very good friend put it in his own neat way, "You would be surprised how dusty he is and how drunk he can be!" From which one gathers that he made no great contribution to British popularity.

On the whole one is inclined to think that, invitation or no



PERFORMERS AT NICE.—Left to right: René Fonck, Mlle. Graby (parachutiste), Willy Coppens, Brack-Papa, Sadi-Lecoq, and Fronval.

## AN APPRECIATION OF THE DH9c.

The following is an extract from a letter recently received from the Compañía Española de Tráfico Aéreo—the Spanish aerial transport company which is running the Seville-Larache Air Line:—

"On the occasion of the completion of the first three months during which we have been operating the first Spanish air service between Sevilla and Larache, we should like to take the opportunity to place on record our satisfaction with the material and personnel provided by you. Using these exclusively, you will be pleased to hear that we have, since the inauguration of our service on October 15th, 1921, till January 15th, 1922, successfully completed 85 return journeys. This represents 42,500 kilometres covered without difficulty or mishap and an incalculable saving in time and increase in regularity over the existing means of transport."

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invitation, it is rather a pity that the Royal Aero Club or some other reputable British organisation was not represented. For example, the Department of Civil Aviation, which is really quite respectable, might have sent an official representative.

The ideal thing would have been for an R.A.F. pilot with mechanic and machine to have gone officially as Lieut. Willy Coppens went for Belgium. But such is not our way, despite our doctrine that "Trade follows the Flag." The R.A.F. has not yet assumed the Navy's most useful function, that of Britain's best commercial traveller.

Of course the members of the Society of British Aircraft Constructors could not afford to do anything. The individual British aircraft maker is so busy trying to pay rates and taxes without any Government orders to help him that he has no money to spare for such remotely propagandist work as demonstrating the superiority of British aeroplanes in France. For, you see, the British Government is economising in the effort to pay the Nation's war debts, and so cannot afford the luxury of an enormous Air Force and a prosperous Aircraft Industry as France can.

And collectively, of course, one could hardly expect the S.B.A.C. to do anything. It is not in English human nature that several firms in any trade should combine to finance one of their number in a trade display which would ultimately be for the benefit of all.

Consequently there was nothing to remind the tens of thousands of people who assisted at the Meeting that such a thing as British Aviation existed. Which explains why a writer in a paper published more or less in English at Montone, for the benefit of Americans and others on the Riviera who can understand the English language, stated in effect that though there were no English aeroplanes present it did not matter much, as we all (British in France) recognise that the French are far ahead of us in aviation. And this, after the recent statement in the House of Commons that in the past 12 months British air-line machines have in comparison with French aeroplanes carried 20% more passengers with 50% less aeroplanes.

As to the Meeting itself, the flying was certainly entertaining, as it was bound to be considering that the finest of French pilots were there. Those flying included Boussoitrot, Fonck, Flächère, Fronval, Madon, Maicon, Nungesser, d'Or, Sadi-Lecointe, Sardiér, and one or two others of French pilots; Brack-Papa, de Domenicis, Ferrarin, and Scaroni of Italian pilots; and Willy Coppens the sole Belgian. But one doubts whether the Public really understood how clever it was. And certainly as a spectacle it was nothing like as effective as a good race.

One agrees word for word with M. Jacques Mortane, at once the most caustic and most practical of French writers on aviation. In a biting article on "L'Aviation Sportive en 1922," in *L'Air* of March 20, he says: "As to the Meetings, they seem to reserve for us the same banalities as those we have already seen: competitions of '8,' of slow-flying, firing at balloons advertising the big stores, simulacra—if I dare say it—of aerial duels, acrobatics, and the inevitable descent in a parachute to satisfy the ignoble mentality of a certain public which spies an accident! If at a velodrome they gave us a spectacle of similar exhibitions—a cyclist playing with a football, making zig-zags on the track, acrobatics, diving from the height of the banking at the turns—I believe there would be not a bad number of vacancies around the balustrades."

There you have a fairly complete description of the Nice Meeting, except that as the actual flying took place over the sea—and it was blowing a gale on the first day—there was the added attraction of the chance of seeing a popular aviator drowned in case of engine failure. Thanks to the excellence of the mechanics there was not even a sign of an engine failure during the whole Meeting.

Actually the aerodrome itself was the right place to see the flying, and the pilots themselves recognised that the real critics were there and not on the Promenade a couple of miles away, for they did their prettiest flying over and round the sheds. Some of it was dangerous flying, but all of it was highly stylish.

Nothing could be neater than Fronval's trick of coming in a trifle higher than the sheds, doing a perfect roll and then panking gently onto the ground. One does not recommend the feat to Snipe pilots, but as done by him on a Morane monoplane (a type said to have been condemned by the Section Technique as insufficiently strong) it is very pretty. He does it all as precisely and as gently as the way he speaks, for to the surprise of those who meet him for the first time, Fronval—the ace of aerial acrobats—is a quiet, modest, neat little man with the gentle voice and manner of a student or scientist. One would like to see a "concours d'adresse" between him and our F/Lt. Longton or Mr. Bulman.

As impressing in a different way was Madon's get-off on a 300-h.p. Nieuport single-seat fighter. He got off at full flying speed, pulled the machine onto a 75-degree bank, and

held her there for three full circles about 50 feet over the heads of his admiring confrères and their friends.

Sadi-Lecointe, on the other hand, got off with a jerk, tucked his tail down and went up in a perfect straight line at about the angle of the average rocket.

Brack-Papa on the huge 700-h.p. Fiat and Ferrarin on the small but nearly as fast Ansaldo took off in a most casual way, in whichever direction their machines were facing quite regardless of the direction of the wind. They evidently had perfect confidence in those wonderful Italian engines of theirs, for if they had failed when getting off down wind towards the south they would have made an unholly mess of themselves among the ruins of a kinkma city at the end of the aerodrome.

Willy Coppens made a capital show on a rotary-engined Hanriot of war-time vintage. How he does what he does with only one foot, pushing or pulling as needs be on one-half of a rudder-bar, is a mystery. He did one particular long glide upside down which would have been a credit to a member of the famous C.F.S. Snipe formation.

De Domenicis flying a Hanriot *d'école* which gave one the impression that it had wheels all over its undercarriage did the most amazing things about six feet off the ground. Apparently the thing has a turning circle rather smaller than that of a London taxi—he could certainly turn it in Piccadilly with ease—and he had a most disconcerting way of flying in and out among the other machines which were on the ground till he found his own station and then squatting the machine flat into it.

Boussoitrot and d'Or, the two famous pilots of Farman "Goliaths," were flying Farman "Sports" (or "Davids" for a change). They have little six-cylinder Anzani engines of 35 h.p. fitted with long exhaust-pipes, with the result that they chug-chug along at about 45 miles an hour making a noise rather like a Ford which is missing on one cylinder—this because one only hears the exhaust of the three cylinders on the side on which one happens to be. They got off in about ten yards across the aerodrome, which is about 100 yards wide, and on reaching the shingle-banks next the sea at the far side were up at about 50 feet.

Nungesser on a Morane monoplane, Flächère on a side-by-side Spad, Fonck on a Nieuport, and the rest, all flew with dash and effect.

When on the ground the pilots were a remarkably cheery crowd. They were all good friends, all making jokes at one another's expense, and all ready to help one another when needed.

The aerodrome end of the show was splendidly run by M. Saladin. With watch and programme in hand he had every pilot off to the moment of the time-table. He never fussed nor fumed nor dashed about. He just moved quickly and quietly from place to place and got things done. Our own people at the R.A.F. Pagant, whom one regards as the most wonderful keepers of programme time on record, could not have done better. M. Saladin must surely be one of the most valuable men connected with French sport to-day.

If only all the Meeting had been run as it was at the aerodrome end it would have been very good fun indeed. But there one was dealing with a first-class man who knows his job, whereas at the Promenade end one was dealing, presumably, with a Committee, and it is quite surprising how in any country the mere act of electing a sensible business man onto a Committee turns him *ipso facto* into a blithering idiot. Still, the discourtesy which one experienced at Nice (except for the extreme courtesy shown by MM. Bonvallet, Muscat, and Saladin) was so exactly like that which one received from the Committee of the Paris Aero Show last December that one begins to think that there may be something in the suggestion then made by Captain Sayers to the effect that in the hour of victory the French are apt (in mass, with individual exceptions) to forget that courtesy which distinguished them in less exalted periods.—C. G. G.

## AIR EXHIBITION NOTICE TO GROUND ENGINEERS.

No. 4, 1922.—BRISTOL "TOURER" AND BRISTOL "FIGHTER" AIRCRAFT: ALERON CONTROLS.

It is hereby notified: (1) The attention of Ground Engineers is directed to the aileron control cable fairlead which passes through the compression rib adjacent to the aileron control pulley in the wing on Bristol "Tourer" and Bristol "Fighter" aircraft. Instances have occurred of aileron control cables badly fouling these fairleads during normal travels of the ailerons.

(2) When fitting modified pulley guards as detailed in Notice to Ground Engineers No. 9 of 1921, or in cases where they have been fitted, it will be necessary for the fairlead through the compression rib adjacent to the pulley to be deleted. The hole remaining in the compression rib should be elongated to allow the aileron control cable to clear at all positions of the pulley.

Air Ministry, April 17th, 1922.

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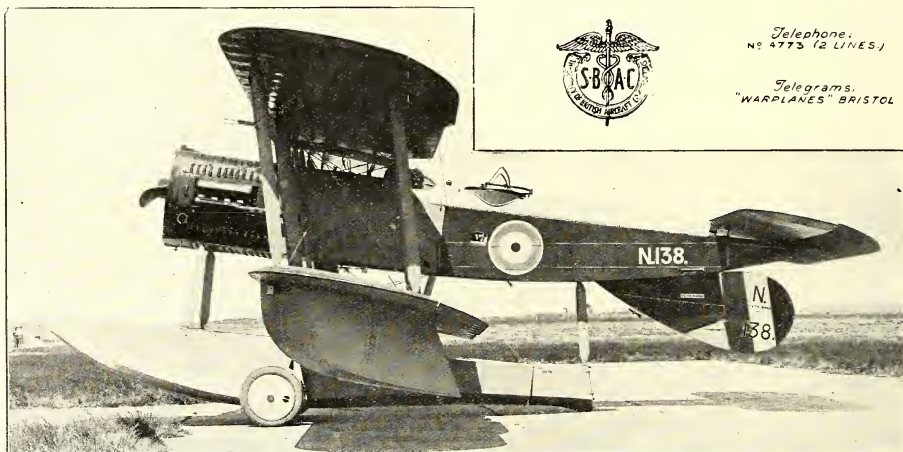
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(Continued from page 276)

F.T.S. in the 1st round; L./AC. Mullen (Usbridge) beat AC. Cosgrove (Rushlip) in the 1st round; L./AC. Moss (Usbridge) beat AC.2 Symons (Maston) on points; AC. Sandy (Maston) beat AC. Wilson (Calshot) on points.

Welter Weights.—First Series.—AC. Ralph (Maston) beat AC. Dunn on points; AC. J. H. Hughes (Leuchars) k.o. AC. O'Connell (Maston); AC. J. Brady (C. and W. School) beat AC. Bills (Halton) on points; AC. Proctor (H.O. C.A.) beat Cpl. Cockburn (Halton) in the 1st round; AC.2 Marshall (Maston) beat AC.2 Finney (No. F.S.) on points; AC.2 Lain (Maston) w.o. AC.2 Winchester (Usbridge) absent; AC.2 Milson (Rushlip) beat AC.2 O'Driscoll (No. 2 Sqn.), in the 1st round.

Middle Weights.—First Series.—AC.2 Fairbairns (holder) beat AC.2 Kerby (Halton) in the 2nd round; Cpl. J. Higgins (holder) (Crawwell) beat AC.2 Mather (Halton) in the 2nd round; L./AC. Fisher (Andover) beat A./Cpl. W. F. Fulcher (Isle of Grain) in the 2nd round.

Light Heavy Weights.—L./AC. Fairbairns (holder) (Crawwell) beat AC.2 Cox (Usbridge) in the 2nd round; Cpl. D. Blythe (Crawwell) beat AC.2 Williams (Halton) on points.

The results of the second day's boxing were:—

## OFFICERS.

Feather Weights.—Semi-Finals.—F/O. H. E. Walker (25 Sgdu.) beat F/O. E. Bird (Martlesham) on points; F/O. J. E. V. Lundy (No. 5 W.T.S.) beat F/O. C. C. Howard (C.F.S.) (holder) on points. Final: Walker beat Lundy on points.

Light Weights.—Final.—F/O. Butty-Bratt (Crawwell) beat F/O. S. Smith (Recruiting Depot Glasgow), who was disqualified.

Welter Weights.—Semi-Finals.—F/O. H. G. Rowe (No. 207 Sqn.) beat F/O. A. J. Adams (Usbridge) on points. F/O. F. E. C. Benstead (No. 2 Sqn.) beat F/O. Eardley-Wilmut (Bircham Newton) on points. Final: Rowe beat Benstead in the 2nd round, the referee stopping the bout.

Middle Weights.—Semi-Final.—F/O. A. W. C. Hayes (Usbridge) beat F/O. H. J. Dunn (Halton) on points; F/O. H. E. Furrow (No. 1 F.T.S.) beat F/O. T. J. Shaw on points. Final: Furrow beat Hayes on points.

Heavy Weights.—Semi-Final.—F/O. J. T. Hall (Maston) beat F/O. R. C. Birckbeck (D.F.C. Halton) on points; F/Lt. D. J. W. Brady, D.S.M. (Halton) (holder) beat F/O. V. Clarke, M.C. (C.F.S.) on points. Final: Brady beat Hall on points.

## OTHER RANKS.

Fly Weights.—Semi-Finals.—AC. J. Lizard (Usbridge) beat AC.2 Lawler (No. 1 F.T.S.) on points; AC.2 Lander (Halton) knocked out AC. Goodman (Leuchars) in the 2nd round. Final: Lizard beat Lander, the latter retiring in the first round owing to injured hand.

Bantam Weights.—Semi-Finals.—F/O. W. Ballantine (Leuchars) w.o. AC.2 Davis (Halton) absent; A./Sjt. J. S. Sallows (E. and W. School) (holder) beat AC.2 J. McLaughlin (Donibristle) on points. Final: Ballantine beat Sallows after a draw.

Feather Weights.—Second Series.—AC.2 Borland (Grain) beat L./AC. J. Woods (Calshot) on points; AC.2 Jackson (Halton) beat AC.2 E. Griggs (Henlow) on points; Cpl. Barnes (Henlow) beat AC.2 Campbell (Maston) on points; AC.2 R. F. Ford (E. and W. School) beat AC.2 R. H. Wilson (Leuchars) on a knock-out in the second round. Semi-Finals: Jackson knocked out Borland in the first round; Ford beat Barnes on points. Final: Jackson beat Ford on points.

Light Weights.—Second Series.—AC. Fairbairns (Usbridge) beat AC.2 Jackson (Calshot), who retired in the 3rd round. Semi-Finals: L./AC. Mullen (Usbridge) beat AC.2 Page (Halton) on points; AC.2 J. Sandy (Maston) beat AC.2 Fairbairns (Usbridge) on points. Final: Mullen beat Sandy on points.

Welter Weights.—Second Series.—AC.2 A. Ralph (Maston) beat AC.2 J. H. Hughes (Leuchars) on points; AC.2 J. H. Winchester (No. 2 F.T.S.) beat AC.2 Proctor (H.O. C.A.) on points; AC.2 Marshall (Maston) beat AC.2 Lane (Maston) on points; AC.2 J. G. Hunter (Donibristle) beat AC.2 Milson (Rushlip), who retired in the 2nd round. Semi-Finals: AC.2 J. Brady beat AC.2 A. Ralph on points; AC.2 Hunter beat AC.2 Marshall, the fight being stopped in the 3rd round. Final: Brady beat Hunter on points.

Middle Weights.—Semi-Finals.—Cpl. J. Higgins (Crawwell) beat AC.2 R. Ballantine (Winchester) on points; L./AC. Fisher (Andover) beat AC.2 Barnard (Halton), who retired in the second round. Final: Higgins beat Fisher on points.

Light Heavy Weights.—Semi-Finals.—L./AC. Fairbairns (Crawwell) beat Cpl. D. Blythe (Crawwell) on points; AC. Bishop (Gosport) beat AC. Addison (Maston) on points. Final: Fairbairns (holder) knocked out Bishop in the 2nd round.

Heavy Weights.—Semi-Finals.—AC.2 J. Hankinson (Usbridge) k.o. AC.2 Forrester (Halton) in the 2nd round; Cpl. E. S. Leary (Usbridge) (holder) b.ve. F/Lt. Leary beat Hankinson on a foul in the 2nd round.

## ROYAL AIR FORCE AND AIR RACING.

The Air Council have informed the Royal Aero Club that they have authorised Air Officers Commanding to give permission to Officers and Airmen to take part in Air Race Meetings organised by the Royal Aero Club at Waddon Aerodrome on April 17th, June 5th, and August 7th, subject to the provisions of the King's Regulations.

## THE R.A.F. POINT-TO-POINT.

The Air Force point-to-point meeting was held at Kimble, Bucks, over the Old Berkeley country, on March 22nd. There were four races and a total entry of 60. The results were:—

## OPEN NOMINATION RACE.

Mr. W. Chapman's Miss Jarley (Deverell), 1; Mr. W. G. Carr's The Padre (Owner), 2; Mr. J. W. Simons' Berrylfield Beauty (Owner), 3.

## ROYAL BUCKS HUSSARS RACE.

Mr. T. Gadsden's Oracle (R. Chilton), 1; Mr. W. Chapman's Shady Girl (Owner), 2; Mr. W. S. Woods' Aston Lass (Owner), 3.

## ROYAL AIR FORCE RACE.

S/Ldr. H. W. H. James' Greyhilt IV (Owner), 1; Wing/Cmdr. A. S. Barratt's Alfred (Owner), 2; S/Ldr. H. Beauchamp's Guinea Pig (Owner), 3.

## FARMERS' RACE.

Mr. J. W. Simons' Berrylfield Beauty (S. Wood), 1; Mr. H. E. Terry's Tarzan, 2; Mr. T. Gadsden's Oracle (R. Chilton), 3.

Despite inclement weather and the counter-attraction of another point-to-point meeting in the country, the meeting was a decided success from all standpoints, and it is hoped to make the meeting a regular fixture.

## Henlow Notes.

Our three Association football teams continue to do well. "A" team set a seal to their reputation recently, when they travelled up to London and beat Charlton Athletic, who are prominent in the League 3rd Division, by 2 goals to 1. The Athletic played seven of their regular team, and the other four were by no means passengers.

In default of Depot fixtures about half our Rugby fifteen have been playing regularly for Bedford Town Club, and thereby gaining much invaluable experience against teams of note.

L.A.A.D. Hockey Eleven recent beat the G.N.R. by 6 goals to 1 in London. This victory over a team which enjoys a high reputation in the hockey world has brought us into touch with many other good class clubs. Next year we should have a bumper season at hockey, and it is hoped that many more airmen will take an interest in the game.

F/O. Scott's hut won the inter-barrack hut shooting championships. The competition for the Depot miniature range individual championship is now in progress. The outdoor range will shortly be re-opened. The rifle club is immensely popular, and it has been found possible to purchase some new .22 rifles, to fit rifles with aperture sights, and to provide four good telescopes. In matches we have beaten the local Territorials and the Shefford club.

At Grid Golf/Capt. Burdett tied for the April monthly medal at Letchworth.

On the 3rd instant took place what proved to be by far the best boxing tournament ever held on the Station. S/Ldr. Pettengill bids fair to outlive Mr. C. B. Cochran; due to his keen interest in the promotion of the sport no less than 32 contests figured in the programme, and with an extraordinary small number of exceptions all the fights were of the needle variety. The A.R.S. won the novices team championships; E.R.S. next, H.Q. third. It is early days yet, but on the form shown by our novices last week our eyes are once again turned Wakefield Cup-wards. In addition, the station individual championships were fought out. Cpl. Abbott, who did so well at Cranwell against Sergt. Stone, boxed a special six round contest with Pte. Bass, Heats and Beds Regt., whom he beat by a narrow margin of points.

The Astra Club staged another successful concert on the 4th. Besides some excellent local talent, various artistes from local theatres gave their services, and an enjoyable programme was the result.

## Uxbridge.

ASSOCIATION.—Bulldog Club. Third Round. Played at Uxbridge April 1st, 1922. Result, R.A.F. Depot 4, Grenadier Guards 2.

The Grenadiers opened in fine style and secured a point from a penalty within five minutes of the start. For some time play was very scrappy with the Guardsmen having slightly the best of matters despite losing a man through injury. Half-time arrived with the score 2 all.

On resuming the Depot took command of the game and bombarded the Guards' goal from all angles, scoring two more goals in quick succession. The Guards' backs, particularly on the right, did some fine work.

## R.A.F. V. R.N.—Association Football.

The Royal Navy beat the R.A.F. at Portsmouth on April 5th by 2 goals to nil. The R.A.F. has some excellent players but they lack combination. The first goal was scored in the first half, and in the second half one of the Air Force team turned the ball into his own goal. The Air Force team were: F/O. Bayes, goal; Sjt. Nichols and AC. Dempsey, backs; AC. Facer, F/O. Gairdner, and AC.2 Shand, half-backs; Cpl. R. Wash, F/Sjt. Goffin, F/Lt. Pakenham-Walsh (captain), AC.2 Ross, and AC.2 Barry, forwards.

## Malta.

The R.A.F. have been taking a prominent part in the sports and athletics in the Island of Malta, and considering their small number when compared to the Navy and Army they have shown up very creditably during March.

Polo.—The R.A.F. played the Royal Sussex Regt. on March 6th, and were rather badly beaten by 5 goals to nil, but as this was only the second match that they had played as a team no other result could be expected. In addition one member of the side was very badly mounted.

The R.A.F. team consisted of: No. 1, S/Ldr. Shepherd (267 Sqn.); No. 2, S/Ldr. Gordon (Grp. H.Q.); No. 3, Air Cndr. Sanson (Grp. H.Q.); Back, F/Lt. Maclean (267 Sqn.).

Goal.—The R.A.F. played the Gordon Highlanders on March 7th, the R.A.F. winning by 4 matches to 2.

R.A.F. team: S/Ldr. Shepherd (267 Sqn.); F/Lt. Maclean (267 Sqn.); F/Lt. Keeble (H.M.S. Argus); F/O. Harris (267 Sqn.).

In the United Services Championship the R.A.F. were beaten by the Army by 15 points to 13.

R.A.F. team: S/Ldr. Shepherd, F/Lt. Keeble, F/Lt. Stewart, S/Ldr. Kelly, S/Ldr. Gordon, F/Lt. Maclean, F/O. Harris, F/Lt. Sadler.

### 28 Squadron, Kohat.

28 Squadron competed in the R.A.F. Championship Meeting at Ambala on March 6th to 14th, with the following results:—

ASSOCIATION FOOTBALL.—1st round: a bye. 2nd round: 28 Sqn. beat 27 Sqn. by 2 goals to nil. 3rd round: 28 Sqn. beat R.A.F. School by 2 goals to nil. In the final 28 Sqn. were beaten by the R.A.F. Depot (India) by 2 goals to 1.

HOCKEY.—No. 5 Sqn. beat 28 Sqn. by 3 goals to 2, the winning goal being scored in the last minute of the 20 minutes' extra time.

BOXING.—A. C. Wolfson won the Featherweight competition. Runners-up from 28 Sqn. were F/O. Knicker (Officers' Light-weight), A. C. Asquith (Men's Light-weight), and A. C. Stone (Men's Fly-weight).

Station Sport:—

ASSOCIATION.—28 Sqn. second eleven played "B" Co., the Border Regt., on March 10th, and were beaten by 3 goals to 1, after quite a good game. In the first half play was more in favour of the Borderers, who scored two goals in succession after about 20 minutes' play. Soon after this the R.A.F. forwards got away and were able to score through A.C. Ross after some good passing.

About 10 minutes after the restart, the Borderers managed to score another goal, by hitting the upright and turning into the goal-mouth. The rest of the play was more in mid-field, both sides pressing hard, and the game ended with no further score. Owing to the heavy duties at present in the Squadron the R.A.F. were unable to turn out their full team, but great credit is due to their substitutes, also A.C.s Rapson and Reid, who played a good game for the defence.

HOCKEY.—"D" Co. Signals, R.E., beat 28 Squadron by 1 goal to nil on March 11th. Play in the first half was more in mid-field neither side's forwards being able to get away to score.

After change of ends the R.E.s scored at close range after some neat passing by their forward line. This, of course, put new life into the R.A.F., and several corners were forced without any results, great work being done by A.C.s Rapson and Groat in trying to score.

### The Annual Dinner of No. 46 Squadron.

The annual reunion of No. 46 Squadron, R.F.C. and R.A.F., was held on April 1st at Simpson's Restaurant. Twenty-five sat down to dinner, including several guests. Luxmore, who turned up for the preliminary "pow-wow," unfortunately had to return to hospital at seven o'clock.

Everybody was very pleased to see "Babs" (S/Ldr. Philip Balcotton) back in England again, and especially when he hinted at the possible reservation in the dim, distant, axless future of "good old Forty-six."

Among those present were the Padre, Taylor, Taffy Hughes, Shadwell, Marchant, Debenham, Lee, Robinson, Smallman, Williams, Quilter, Robeson—and, of course, the inimitable "Normie."

Messages were received in divers ways from Courtneidge (in Australia), Fortin (in Canada), Bulman, and Mealing. All thanks are due to Marchant, to whose energies this reunion is almost entirely due.

A thoroughly successful evening ended with the old wartime ditties at the piano, after which everybody went out and gave a helping hand to the University (Boat Race) invaders. —"L."

### R.A.F. Hon. Cricket Secretary.

The duties of hon. secretary of the R.A.F. Cricket Association have been taken over by Grp/Capt. N. D. K. MacEwen, C.M.G., D.S.O., who commands the C.F.S. at Upavon. Grp/Capt. N. J. Roche, O.B.E., whom Grp. Capt. MacEwen succeeds, is shortly proceeding overseas.

### THE HEALTH OF THE R.A.F.

Under the above heading a comprehensive Official Report for the year 1920 has been received from the Air Ministry.

Chapter I deals with the Air Force as a whole and includes a number of analytical tables showing the average annual strengths of the various units and the ratios of disease and injury. Section 4 of this chapter classifies the disease and injury among the different branches and trades. The highest proportion of injuries in any trade group is shown as among transport drivers, the average being 114.42, of which there were 102 cases of accidents caused by starting motors. (This as against only 25 caused by prop swinging.) The total number of accident cases for the year was 1,270, of which 540 were attributed to "athletics," thus proving that the Sports and Pastimes pages of *The Aeroplane* are in fact more closely concerned with casualties than are any others.

Nineteen pages are devoted to "nosological tables," showing sickness under geographical areas.

Chapter II deals exclusively with the United Kingdom. It would appear from the table given that Ireland is the healthiest Command and the Inland Area the unhealthiest. This latter is owing to the fact that Uxbridge, which is the

reception Depot for all recruits, the place of concentration of drafts for inoculation, etc., and the unit from which sick men are discharged, is included in the Inland Area figures.

Chapter III deals with units abroad, excluding India. There is a lengthy report on an outbreak of Sandfly Fever in Baghdad, the probable causes of the outbreak and the preventive steps which are being taken.

"Z" Expedition to Somaliland is discussed as being of special medical interest, the medical arrangements having been entirely controlled by the R.A.F.M.S. A modified D.H.6 was used as an aerial ambulance, camels and pony litters having been the only other transport for sick and wounded previously available.

The health of the R.A.F. in India is summarised in Section 2 of Chapter IV under the following headings:—(a) The effects of malaria on flying ability. (b) Glare and its effects. (c) Treatment of sun glare and (d) The physical efficiency tests. Tinted glasses are essential for pilots from April to October, but are unpopular among pilots as they cause unnatural landscapes.

Section 3 of this chapter deals with Functional Nervous Disorders among R.A.F. Officers, and Section 4 with the medical examination of recruits.

On page 72 is a table showing the soil, altitude, etc. of the principal aerodromes in the United Kingdom, and an account of the hygienic systems of various units follows the table.

With regard to vaccination among cadets, recruits and boys, 62 per cent. have been vaccinated, and among drafts proceeding overseas 90 per cent. were fully protected before departure.

Section 8 is a table of surgical operations and shows a total of 632 successful operations and 11 failures in R.A.F. Hospitals and Sick Quarters, and 530 successful and 15 failures in R.N., Army and other hospitals.

Altogether a most interesting and instructive document.

### "THE AIRMAN."

After a lapse of three months the *Airman* has appeared again, the new issue being No. 1 of Vol. 2. The *Airman* is the station magazine of the R.A.F., Manston. The new edition is a distinct improvement on the old one. There is less space devoted to personalities and more to sport. Of the 24 pages of reading matter in the February number eight consist entirely of sports news. Editorial comment is brief and to the point, and an excellent photograph of Wing/Comdr. Landon, D.S.O., O.B.E., commanding the R.A.F., Manston, appears on the first page.

A series of articles entitled "Famous Fighting Airmen" starts with this number, the first being Capt. Ball, and also a series of very good drawings of aeroplanes used in the War. The Camp Cinema, the Manston Concert Party, and the Sjt.-Major Instructor are freely discussed. Three and a half pages show the great heights to which the Station "Rugger" team rose before the disastrous crash at Uxbridge on Jan. 23rd, and shorter articles show that in "Soccer," Boxing and Hockey the R.A.F., Manston, are very hard to beat.

The paper and printing are good and the eleven pages of advertisements look decidedly healthy. On the whole the new joint Editorship is to be congratulated on what is now an extraordinarily sound little paper.

### THE CRANWELL MAGAZINE.

The *Cadet College Magazine*, No. 1 of Vol. II of which has just appeared, is from the point of view of Service publications quite exceptional. The magazine appears twice yearly, in the Spring and in the Autumn. This issue includes the Commandant's December report, articles on shooting in the air, engines, and Russia, the latter by Sir Philip Gibbs.

There are good accounts of two of the chief sporting events of the past 6 months, namely the Rugger matches (illustrated) against Sandhurst and Woolwich and an interesting description of the Cranwell Beagles. But, except for a photograph of the Soccer team and one of a boxing team, according to the *Magazine* no other sport exists at Cranwell—unless of course they count chess and the Debating Society, to which pastimes a certain amount of space is devoted.

There are some very amusing drawings, one or two humorous articles suitable for juvenile mentalities and some slightly cumbersome verse. There are also some excellent photographs, beautifully reproduced.

The *Magazine* will doubtless amuse and possibly enlighten the R.A.F. cadets at Cranwell and some others.

### PERSONAL NOTICES.

DEATH.—MAUDE-ROXBY.—On April 12th, Marlow, Bucks, of acute pneumonia, Lieut.-Col. Francis Maude-Roxby, O.B.E., D.F.C., Legion of Honour, fourth son of the late Rev. Henry Maude-Roxby, of Buckden, Huntingdonshire.

BIRTHS.—CATCHPOLE.—On April 8th, at Charlotte, Felixstowe, to Gwen (nee Llewellyn), the wife of William Catchpole, R.A.F., a daughter.

NELAREN.—On April 8th, at Ivy House, Devizes, a son of F/O. J. A. McLaren, M.C., R.A.F.—a son.





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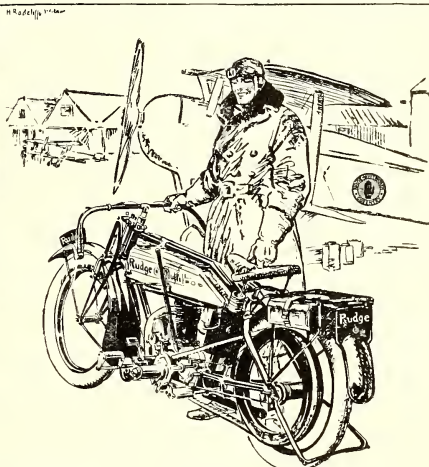
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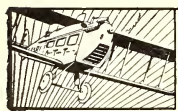
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#### CONTINENTAL ARRIVALS AND DEPARTURES.

[The following table of arrivals at and departures from the British Air Ports is compiled on the following system:—First comes the initials of the Air Line; next the type of machine; next the international number of the machine; next the ports of departure and destination; next the times of departure and arrival; next the cargo, whether goods (G) and/or mails (M); next the number of passengers; and finally the name of the pilot and number of mechanics, if any.]

ABBREVIATIONS: A.—A.D.—Aircraft Disposal Co. B.A.—Berkshire Aviation Co. B.C.—Bristol Aeroplane Co. C.A.—Department of Civil Aviation. D.—Daimler Aircraft. D.H.—De Havilland Aircraft Co. G.E.—Compagnie des Grands Express Aeriens. H.P.—Handley Page Transport Ltd. I.L.—Instone Air Line. K.L.—Koninklijke Luchtvaart Maatschappij. L.A.—L'athermal Aviation Services. M.A.—Messageries Aeriennes. M.W.—Marconi Wireless Telegraph Co. Ltd. P.O.—Privately owned. P.L.—Peters Ltd. S.F.—Surrey Flying Services. S.N.—Syndicat National pour l'Etude des Transports Aériens (S.N.E.T.A.).

#### The London Terminal Aerodrome, Croydon. (Telephone: Croydon 2720.)

##### APRIL 10th:

M.A., Breguet, F-CMAE, London-Paris, 07.15—, G., Nil, Delage.  
H.P., DH18, G-EAWX, London-Paris, 11.16-14.40, G., Nil, Olley.  
H.P., G-EATH, London-Paris, 12.17-16.05, G.M., 5, Wilcockson & I.  
M.A., Spad, F-ADAG, London-Paris, 12.30-15.35, G.M., 1, Nil, Revenue.  
I.L., Vimy, G-EASI, Paris-London, 12.31-15.35, G.M., 2, Powell & I.  
I.L., DH18, G-EAWW, London-Paris, 13.01-17.30, G., 2, Shepperson & I.  
I.L., DH18, G-EARO, Paris-London, 11.35-13.15, Nil, Bradley & I.  
M.A., Goliath, F-ADAY, Paris-London, 12.35-15.50, G.M., 3, Le Men & I.  
C.E., Goliath, F-GEAC, Paris-London, 13.35-15.35, G., 2, Favreau & I.  
H.P., DH18, G-EAWX, Paris-London, 15.00-18.11, G., 2, Shepperson & I.

##### APRIL 11th:

M.A., Breguet, F-ADBM, London-Paris, 07.08, 14.35, G., Nil, Donlin.  
I.L., DH18, G-EARO, London-Paris, 12.21-15.05, G.M., 5, Holmes & I.  
M.A., Goliath, F-ADAY, London-Paris, 13.10-16.10, G., 1, Le Men & I.  
I.L., DH18, G-EAWX, London-Paris, 15.15-17.45, G.M., 2, Robins & I.  
I.L., DH18, G-EAWW, Paris-London, 11.00-13.11, Nil, Shepperson & I.  
I.L., Vimy, G-EASI, Paris-London, 11.01-13.40, G.M., 1, Nil, Powell & I.  
H.P., G-EATH, Paris-London, 13.20-16.35, G., 10, Wilcockson & I.  
M.A., Goliath, F-THMO, Paris-London, 14.30-17.20, G.M., Nil, Compét.  
I.L., DH18, G-EARO, Paris-London, 16.30-19.28, G., 6, Holmes & I.

##### APRIL 12th:

M.A., Goliath, F-THMO, London-Paris, 09.15-13.40, G., Nil, Compét.  
I.L., Vimy, G-EASI, London-Paris, 10.28-15.35, G.M., 2, Courtney & I.  
G.E., Goliath, F-GEAC, London-Paris, 13.10-17.30, G., 6, Favreau & I.  
H.P., Bristol, G-EAWW, London-Paris, 11.12—, G.M., 5, Olley & I.  
I.L., DH18, G-EAWW, London-Paris, 15.09-18.55, G., 6, Jones & I.  
I.L., DH18, G-EARO, London-Paris, 16.03-20.00, Nil, 7, Bradley & I.  
M.A., Breguet, F-CMAG, Paris-London, 07.30-10.53, 13th, G.M., Nil, Portal.  
I.L., DH18, G-EAWW, Paris-London, 10.15-12.30, G., 1, Robins & I.  
G.E., Goliath, F-ADDT, Paris-Ldn, 12.15-11.00, 13th, G., 7, Chalmers & I.  
I.L., Vimy, G-EASI, Paris-London, 16.10-18.52, G., 6, Courtney & I.

##### APRIL 13th:

I.L., Vimy, G-EASI, London-Paris, 10.44-13.55, G.M., 8, Powell & I.  
H.P., G-EATH, London-Paris, 12.15-15.50, Nil, 8, Wilcockson & I.  
H.P., DH18, G-EAWX, London-Paris, 12.17-15.10, G.M., 6, Carter & I.  
D.A., DH34, G-EBBS, London-Paris, 13.12-15.55, Nil, 5, Herne & I.  
I.L., DH18, G-EARO, London-Paris, 15.15-18.05, G.M., 8, Shepperson & I.  
I.L., DH18, G-EARO, Paris-London, 10.10-12.51, G., 1, Bradley & I.  
M.A., Spad, F-ADBS, Paris-London, 12.14-10.53, 14th, G.M., Nil, Range.  
G.E., Goliath, F-ADDS, Paris-London, 12.20-15.20, G., 9, Labouchere & I.  
M.A., Goliath, F-ADCA, Paris-London, 13.30-11.00, 14th, G.M., 1, Challoux.  
I.L., Vimy, G-EASI, Paris-London, 16.00-18.35, Nil, Nil, Powell & I.

##### APRIL 14th:

H.P., DH4, G-EAWH, London-Paris, 10.20-13.40, Nil, 2, Rogers.  
I.L., Vimy, G-EASI, London-Paris, 10.30-16.10, G.M., 2, Robins & I.  
G.E., Goliath, F-ADDS, London-Paris, 12.15-17.05, G., 5, Labouchere & I.  
M.A., Breguet, F-CMAG, London-Paris, 13.02-17.10, G., 1, Robyn.  
H.P., DH18, G-EAWX, Paris-London, 13.10—, Nil, 6, Shaw & I.  
M.A., Breguet, F-CMAK, Paris-London, 07.00-09.47, G.M., Nil, Faile.

#### The London Terminal Aerodrome.

On Monday Mr. Stocken, duly returned from leave, was testing the D.H.9a with an "Eagle" Rolls-Royce engine and later on he was testing the Liberty D.H.9a for the races. This machine is painted light helicopter and the engine is outlined in black.

Mr. Stocken has given it the delightful Greek name *airopo aidys*. The pilot's seat has been streamlined well and the passengers' cockpit has been covered in alto-gether.

Major Foot left for Brussels on an Avro the same day.

The following day Mr. Stocken was again out on *airopo aidys* doing tests and every day and in every way getting confidant

I.L., DH18, G-EAWX, Paris-London, 09.45-11.52, Nil, 2, Carter & I.  
I.L., DH18, G-EAWW, Paris-London, 10.00-12.25, G., 4, Jones & I.  
I.E., Goliath, F-ADAY, Paris-London, 11.52-14.15, G., 5, Favreau & I.  
M.A., Goliath, F-ADDO, Paris-London, 13.35-16.10, G.M., 2, Drauhin & I.  
H.P., DH4, G-EAWH, Paris-London, 15.25-17.15, Nil, 8, Rogers.  
I.L., Bristol, G-EAWW, Paris-London, 15.30-17.35, Nil, 4, Olley & I.  
D.A., DH34, G-EBBS, Paris-London, 15.37-17.50, G., 1, Herne & I.

##### APRIL 15th:

M.A., Spad, F-ADBB, London-Paris, 07.58-11.26, G., Nil, Range.  
I.L., DH18, G-EAWW, London-Paris, 10.37-13.55, Nil, 2, Holmes & I.  
G.E., Goliath, F-ADDT, London-Paris, 13.27—, G., 1, Favreau.  
I.L., DH18, G-EARO, London-Paris, 15.32-18.50, G., 5, Courtney & I.  
M.A., Breguet, F-CMAB, Paris-London, 07.00-09.42, G.M., Nil, Delage.  
I.L., DH18, G-EARO, Paris-London, 10.55-13.00, G., 7, Shepperson & I.  
I.L., Vimy, G-EASI, Paris-London, 10.37-13.40, Nil, 10, Robins & I.  
L.L., Fokker, H-NAET, Avion-Ldn, 11.45-15.24, G., 1, Gessendorfer.  
G.E., Goliath, F-GEAO, Paris-London, 11.30-14.25, G., 12, Chalmers & I.  
M.A., Goliath, F-ADAY, Paris-London, 13.35-16.20, G.M., 1, Charpentier.  
I.L., DH18, G-EAWW, Paris-London, 15.10-17.24, G., 4, Holmes & I.  
H.P., G-EATH, Paris-London, 15.30-18.37, G., Nil, Wilcockson & I.

##### APRIL 16th:

M.A., Goliath, F-ADCA, London-Paris, 10.48-13.51, G., Nil, Challoux.  
D.A., DH34, G-EBBS, London-Paris, 11.00-13.35, Nil, 1, Robinson & I.  
I.L., Vimy, G-EASI, London-Paris, 11.15-14.06, G., 2, Bradley & I.  
H.P., G-EATH, London-Paris, 13.15-16.12, G.M., Nil, Wilcockson & I.  
M.A., Goliath, F-ADDO, London-Paris, 13.32-16.40, Nil, Nil, Drauhin.  
M.A., Breguet, F-ADBM, Paris-London, 07.32-10.55, G.M., Nil, Revenue.  
I.L., DH18, G-EARO, Paris-London, 10.15-12.51, Nil, 1, Courtney & I.  
M.A., Spad, F-ACMF, Paris-London, 12.45-15.49, G., 2, Perignon.  
H.P., Bristol, G-EAWW, Paris-London, 15.30-17.45, G., Nil, Rogers & I.  
D.A., DH34, G-EBBS, Paris-Ldn, 16.22-10.36, 17th, Nil, Nil, Robinson & I.

#### Flying by the Aircraft Disposal Co.

April 10th.—D.H.9, G-EBJ, test (Stocken); D.H.9a, G-EAXC, test (Stocken); Avro, G-EBGD, left for Brussels (Foot).

April 11th.—D.H.9a, G-EAXC, test (Stocken).

April 12th.—D.H.9, G-EBJ, two tests (Stocken).

April 13th.—Parnall "Panther," G-EBGM, test (Muir); Martinsyde, G-EAXB, tests, (Stocken).

April 14th-16th.—Nil.\*

#### Cross-Channel Statistics.

Week ending April 16th:—

Machines, 75; Passengers, 211; Crews, 128; Total Personnel, 339

Corresponding week last year:—

Machines, 53; Passengers, 179; Crews, 69; Total Personnel, 248

Corresponding week 1920:—

Machines, 36; Passengers, 32; Crews, 36; Total Personnel, 68

and confidant. On Wednesday he was giving the Rolls-Royce D.H.9a some further tests.

On Friday afternoon the Parnall "Panther" shot out of the Disposal Company, climbing into the air at a terrific angle. Mr. Muir was her pilot and he flew round about the aerodrome for some time. Mr. Stocken took up one of the "Tinsydes" for the race soon after.

All the three Bessonneaux hangars have now been taken down and their new ones are in course of erection.

On Thursday Major S. T. L. Greer, who from the beginning of Civil Aviation has been senior C.A.T.O., relinquished his post on his appointment to the Instone Air Line, for whom he will organise the Brussels terminal of their air line to that

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city. Major Greer will carry with him all good wishes of those who have come in contact with him during his term of office.

Mr. Baker, who for the past two years has been an assistant C.A.T.O., succeeds Major Greer and it seems that a better appointment could not have been made. Mr. Baker was one of the party which prospecting the Cairo-Cape Air Route in 1919 and saw much service in the East.

Handley Page Transport and the Instone Air Line have been running regularly during the week and the Daimler Airway have been sending machines over when passengers were forthcoming. Until May 1st they will not run a regular service but will carry out tests with the D.H.34s and get the pilots accustomed to the route.

Their new D.H.34 arrived on Monday flown by Mr. Barnard and Mr. Cobham brought over the Instone machine which, however, returned soon after for further alterations.

A "Goliath" fitted with Renault engines has been across from Paris and a very nice job it is. With the pilot's seat in the nose and an adjustable tailplane the "Goliath" would be almost an ideal commercial machine.

The First Fokker of the new service arrived on Saturday piloted by Mr. Geysendorfer, who is looking more robust than ever after his winter in Holland. His many friends were all pleased to see him again. All the Fokkers have been "done up" and overhauled and they are now fitted with emergency exits in the roof. The service to Holland reopened yesterday, Tuesday.

Mr. Larry Carter came in very high on Friday morning on Handley Page's D.H.18 and Mr. Shaw started back on the same machine about 13.00 hrs. He was compelled to land near Agincourt owing to something missing in the engine and he and his passengers went on to Paris by train after a halt at Amiens for refreshment. Mr. Shaw returned to Croydon on Saturday morning.

On Friday and Saturday there was a 40-m.p.h. wind blowing and the machine got thrown about somewhat when near the ground, the Renault "Goliath" and the Fokker getting it particularly badly.

The Cie. des Messageries Aeriennes have been running very regularly their early morning newspaper service both from and to London and Paris. This was supplemented yesterday by the Instone Air Line, who will in future despatch the D.H.4s at 06.50 with a load of papers. This latter service, one gathers, has been engineered by Mr. Greig, who by the way is now in charge of Basil S. Foster Ltd. at the aerodrome.

On Friday a Royal Aero Club machine was committing stunts over the aerodrome and the previous day Admiral Mark Kerr was flying the B.E.2c round for some time. He made a very good landing in spite of the fact that he had not flown since September.

On Sunday Mr. Dudley Palmer was up on a Club Avro going round the racecourse and later Mr. Vincent took up the same machine trying to get to Maidenhead, but as he ran into very thick weather up river he returned to the aerodrome, making a roll or so on the way down.

Mr. Muir was flying his Avro and Mr. Hinkler came in from Hamble on the Avro "Viper."

Mr. Victor Yates, whom old-timers will remember as a Cleriot pilot in the early days of Eastbourne Aerodrome, has purchased Mr. Chapman's D.H.6 and arrived at the aerodrome with it on Sunday. He will use the machine for joy-riding.

Mr. Robinson made his maiden trip to Paris as a pilot of the Daimler D.H.34 on Sunday morning. He returned in the evening.—G. D.

### BRITONS IN JAPAN.

The many friends in this country of the various British aviation people who have gone to Japan will be interested to have some news of the whereabouts of the different members of the Mission.

Colonel the Master of Sempill, Major Bernard Fowler and Messrs. Atkinson, Eldridge, Vaughan Fowler, Loton, and Voikert, with about twenty others, were in February giving instruction in flying and the maintenance of aeroplanes at the Naval Air Station at Kasumigaura, about forty miles north of Tokio.

Major Brackley and Major Chichester Smith, who also belong to Colonel Sempill's group, were working at the Oihama Seaplane Station giving instruction on F.5 flying-boats.

Messrs. Smith, Highland and Jordan, late of the Sopwith Company, were at the Mitsubishi Company at Nagoya building scouts, two of which have already put up a good performance.

Mr. Fletcher, late of the Central Aircraft Company, had transferred to the Japanese Navy, and was designing a torpedo seaplane for them at Yokosuka.

### INTERNATIONAL FLYING.

The following items of interest appear in the report presented by Lieut.-Col. O'Gorman, who was the official representative of the Royal Aero Club at the meeting of the Fédération Aéronautique Internationale held in Paris on Jan. 9th.

The Schneider Cup Race is to be held at Naples during the last fortnight in August this year.

Steps are being taken to introduce the "tryptique" system for aeroplanes touring on the Continent.

The Federation agrees to the introduction of Slow Speed Tests in International Speed Races. The clubs forming the Federation were requested to submit suggestions for these tests.

### LITHUANIA.

The Lithuanian Ministry of Posts and Telegraphs has ratified a proposal to issue special stamps for correspondence despatched by the aerial service shortly to be opened between Kovno, Riga, and Koenigsberg.

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De Havilland Aircraft Co., Ltd., The, Stag Lane Aerodrome, Edgware. "Havilland," Edgware. Kingsbury 160-1, (2 lines) 284	
Faircy Aviation Co., Ltd., The, Hayes, Middlesex "Airily," Hayes, Middlesex. Hayes, Middlesex 19 .....	282
Parnall, George, & Co., Coliseum Works, Park Row, Bristol. "Warplanes," Bristol. Bristol 4773 (2 lines) .....	286
Roe, A. V., & Co. Ltd., Newton Heath, Manchester. "Triplane," Manchester. City 830-1. Manchester .....	Inside Front Cover
Short Brothers (Rochester & Bedford), Ltd., Seaplane Works, Rochester, Kent. "Seaplanes," Rochester. Chatham 627 .....	Inside Back Cover
Supermarine Aviation Works, Ltd., The, Southampton. "Supermarine," Southampton. Woolston 37 (2 lines) Inside Back Cover	
Vickers, Ltd., Vickers House, Broadway, London, S.W.1. "Vickers," Vic. London. Victoria 6900 .....	278
Westland Aircraft Works, Yeovil. "Aircraft," 141 Yeovil. Yeovil 141 .....	Back Cover

## AIR LINES.

Instone, S., & Co., Ltd., 51, Leadenhall Street, London, E.C. Avenue 3616-7-8 .....	288
---	-----

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London Die Casting Foundry, Ltd., The, Tremlett Grove, Junction Road, Holloway, N.12. "Charcoal," Updell, London. Hornsey 1580 (2 lines) .....	292
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---	-----

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Armstrong Siddeley Motors, Ltd., Coventry. "Sidarm," Coventry. Coventry 954 .....	284
Bristol Aeroplane Co., Ltd., The, Filton House, Bristol. "Aviation," Filton. Bristol 3906 .....	277

## FLotation AIR BAGS.

R.F.D. Company, 21, Queen's Road, Hersham, Surrey. Esher 305 .....	292
--	-----

## MOTOR BICYCLES.

Rudge-Whitworth, Ltd., Coventry. "Rudge," Coventry. Coventry 1104 .....	219
---	-----

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Accles & Pollock, Ltd., Oldbury, Birmingham. "Accles," Oldbury. Oldbury 111 .....	291
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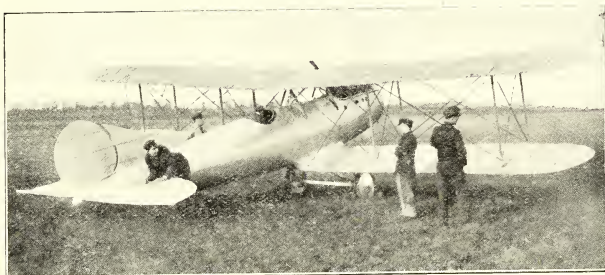
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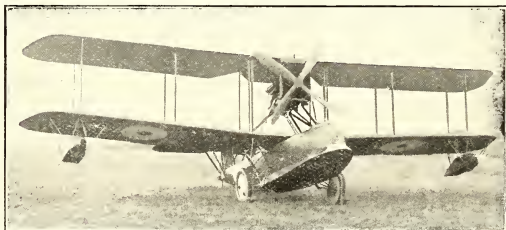
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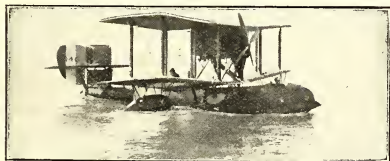
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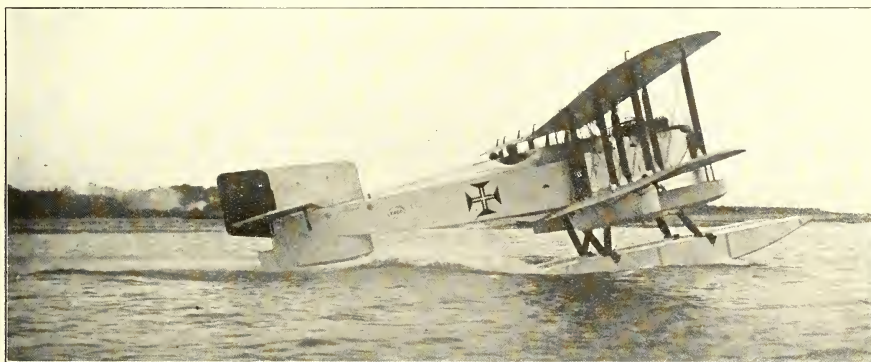
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## ON CANADIAN ENTERPRISE—I.

Of all the British Dominions overseas it may be said fairly safely that Canada leads in the matter of aviation. India, by far the biggest and most populous and richest of all British Dominions, has done practically nothing in connection with aviation. South Africa, which supplies millions of pounds' worth of gold per annum and the bulk of the World's diamonds, has also been too commercially minded to pay any attention to aviation until recently when those who have extracted the gold, but have not kept it, rose in rebellion against their employers and had to be put down by military force. Then the commercial magnates who have previously despised aviation suddenly discovered that aeroplanes could be useful, and used them accordingly. New Zealand has done a little to encourage aviation, but the country is neither rich enough nor populous enough to develop flying in a big way. Australia, which seemed like becoming a happy nauting ground for Aviation soon after the War, has been something of a disappointment but has recently begun to mend its ways with the result that the Royal Australian Air Force has been formed and is now in a fair way to being organised. Also the Australian Government has arranged to subsidise certain air mail routes which will probably in time come definitely into operation to the ultimate good of commerce in Australia.

Canada, unlike all the other Dominions, has started by developing aviation officially, so that when in due course the Canadian business man realises that Commercial Aviation can be developed with advantage to himself he will find that the Canadian Government has everything cut and dried and ready for the development of Civil Aerial Transport.

### A Lead to the World.

A year or so ago one described briefly in this paper what Canada had done up to that date. It may therefore be well to mention once more that early in 1920 an Air Board was formed in Canada to regulate aviation and to organise a Canadian Air Force.

Since then a truly remarkable step has been made by the Canadian Government. First among all the nations of the World the Canadian Government has appointed a Minister of Defence to co-ordinate the work of the three separate organisations for the Army, the Navy and the Air Force. We in this country have been chatting for three or four years about a Ministry of Defence to co-ordinate the work of the three fighting Services. At the end of it all we have got as far as a recommendation from the Geddes Committee that a Ministry of Defence should be formed. And while we have been talking Canada has appointed an official to do the work.

Canada is sincerely to be congratulated on being the first section of the British Empire to take this step. It is one which ultimately must be followed by the Mother Country herself and by the other Dominions. Meantime, so far as Canada is concerned it is of very great advantage to the Air Board which is now placed in the position which allows it to deal on an equal footing with the Army and the Navy so that it is no longer the subordinate of both.

### The Air Board's Hopes.

Naturally the Air Board, composed as it is of men who are all young and energetic but in aviation matters old and experienced, started out with schemes which if the money had been available would undoubtedly have made Canada one of the leading countries in the World so far as aeronautical development is concerned. Unfortunately, as official figures show, the Board had to deal with a Government which was certainly sympathetic but not wildly enthusiastic about aviation. Consequently even in the first year of its existence it was not allowed an unlimited supply of wealth with which to carry out its schemes. Nevertheless, during that first year it actually accomplished a wonderful amount of most valuable work.

Naturally it was hoped that as the result of the good work done during 1920-21-22 it would be possible to induce the Canadian Houses of Parliament to vote more money for aviation for the year 1922-23. Unfortunately the present slump in trade is not our exclusive property. It extends to

Canada also, and though one does not know whether Canada suffers as we do from an Economy-at-any-price Party and Press the Canadian Government is at any rate resolved to economise pretty heavily, as may be seen from the figures for the past two years.

### AIR BOARD ESTIMATES.

The following Estimates for the year 1921-22 were approved at the Air Board Meeting No. 13, March 14th, 1921, subsequently passed by Council, and were tabled in the House of Commons. A comparison of the various items with those of the previous year, indicating an increase or decrease as the case may be, is also shown herewith.

ESTIMATES 1921-22.				
Amount to be Voted .....			\$1,625,000	
Appropriation for Previous Year .....			\$2,000,000	
Decrease .....			\$375,000	
			Compared with	
Details.	1921-22	1920-21	Estimates of 1920-21	
			Increase	Decrease
Salaries (Civil Staff) ...	75,000	50,000	25,000	
Contingencies .....	25,000	50,000		25,000
Canadian Air Force .....	825,000	800,000	25,000	
Civil Aviation .....	700,000	850,000		150,000
Air Service .....		250,000		250,000
Totals .....	1,625,000	2,000,000		375,000

From these figures it may be seen that the Canadian Government was not unduly extravagant in the first place, and the decrease of 375,000 dollars for the past year's work is greatly to be regretted. Nevertheless the Englishman, especially including the Scot, always does best when condemned to make bricks without straw. Therefore one may reasonably expect, when the complete report for the past year's work is issued, to find it not actually greater results at any rate an even higher degree of efficiency than was achieved in the previous year. A matter of roughly £300,000 is not a lot with which to run an Air Board and pay an Air Force.

It is particularly of interest to note that approximately £5,000 more was voted last year for salaries than for the previous year. This, one believes, enabled the Air Board to engage a number of very competent officials who, judging by what one knows of them, are cheap at the price. A similar increase in pay for the Canadian Air Force is also a move in the right direction.

The two big reductions in the Vote for Civil Aviation and for Air Service are somewhat incomprehensible in that there is no subsidy for any of the Civil Aviation concerns in Canada and whatever flying is done is presumably done by the Canadian Air Force as such. One imagines that Air Service includes the work of the various permanent air stations in forest patrols, photography and so forth.

### The Canadian Air Force in Being.

The following paragraph from a recent report issued by the Canadian Air Board is of considerable interest as showing precisely what machines are in use at the Central Training School of the Canadian Air Force and the explanation of the uses of each machine as set forth for the benefit of the Canadian taxpayer.

#### AEROPLANES IN THE C.A.F.

The following is a strength return of machines of various types belonging to the C.A.F. at Camp Borden, in the middle of 1921—

49 AVRO TRAINING MACHINES. (Used extensively during the War for instructional purposes.)

10 CURTISS J.N.4s. (Used for training purposes in Canada, and will now be employed for photography and radio work.)

10 S.E.5as. (A fast scout, extensively used in the War.)

6 D.H.9as. (A long distance reconnaissance and bombing machine, used extensively towards the close of the War.)

2 SNIPES. (The latest type of scout machine in service at the close of the War.)

2 BRISTOL FIGHTERS. (A short distance fighter and reconnaissance machine with a splendid War record.)



It is to be presumed that these machines were those actually on charge, so to speak, to the flying personnel, for unless they have been crashed or burnt the Canadian Air Force in fact owns a very much greater number of machines which were made over to Canada by the R.A.F. at the end of the War.

It is curious to note that the old J.N.4s are still in use and that it was intended in the middle of 1921 to use them for photography and "radio" work. One would have thought that D.H.s with Siddeley "Pumas" would have been very much better in every respect for this work, seeing that they are about 50 per cent. faster, will carry a very much bigger load, and are far more reliable. It is to be presumed, however, that the J.N.4 is regarded as an intermediate machine between the Avro and the D.H.9a, so that pupils who have been trained with rotary engines on Avros may become used to machines with fixed engines. On that supposition the use of the J.N.4s is quite justified for training work, but one confesses to being puzzled as to why they should be used for anything else.

#### Officers and Men of the C.A.F.

It is of particular interest to note that the Canadian Air Force, as in the case of the Royal Australian Air Force, has adopted R.A.F. rank titles. Thus, for example, the Inspector-General is Air Vice-Marshal Sir Willoughby Gwatkin, K.C.M.G., C.B.; the Director of Flying Operations is Wing-Commander R. Leckie, D.S.O., D.S.C., D.F.C.; the Controller of Civil Aviation is Wing-Commander J. S. Scott, M.C., A.F.C.; the Director of Technical Services is Wing-Commander E. W. Stedman, M.I.C.E.; and the Officer Commanding the Canadian Air Force is Wing-Commander R. F. Redpath.

It must be remembered that except for what might be called a Depot Staff at Camp Borden the Canadian Air Force is not a standing force like the R.A.F. The personnel, both officers and men, come up for training at intervals.

The latest report available, from a summary issued on Sept. 30th, 1921, shows that in all 407 officers had passed through the course of training at Camp Borden between the middle of 1920 and 1921. Of these 354 were flying officers and the rest ground officers. During the same period of twelve months 830 airmen had passed through the school. During that period the flying pupils averaged 27 hours flying per week, and the total hours flown were approximately 3,760, which is by no means bad when one considers the Canadian Winter.

Incidentally it is worth while to recall the fact that during

### THE DEBATE ON THE AIR ESTIMATES—(Continued).

Now that the Easter air racing is over and in view of the fact that the House of Commons will shortly be reassembling it is necessary, for historical reasons, to put on record as briefly as possible certain points in the air debate of March 21st, with which it was impossible to deal in *THE AEROPLANE* of April 5th.

When the Air Estimates came to be considered in Committee, with Sir Edwin Cornwall in the Chair, the discussion on Votes 1, 2, 3, 4, and 9 was opened by Mr. BALDWIN RAPER. He pointed out that the figure for Technical and Warlike Stores was 50 per cent. less than for the previous year, which was very unwise in view of the Secretary of State's speech at the Guildhall when he said how important it was that we should have up-to-date machines and do away with old material. Against that he asked why the figure for Works and Buildings was ten times what it had been in the previous year. As to the figure for Civil Aviation he suggested that all its charges were non-effective because it was a non-effective branch of the Air Service.

He also wanted to know why the number of Cadets for the present year should be only 100 as against 135 in the previous year. He asked for an explanation of the provision for two Air Marshals. He drew attention to the anomaly of giving flying titles to doctors, dentists, and accountants, and wanted to know why chaplains should not be called "sky-pilots" and nurses "angels." He drew attention to the dangerous reduction in the recruiting staff in view of the fact that a strong recruiting staff should be maintained in order to obtain the very superior and very intelligent type of man required by the R.A.F.

On Vote 3 he reminded the House that all the machines at present in use are pre-Peace and said that it was unjust to ask people to take the risk of using these old machines. On the subject of the £86,800 for engines he pointed out that this was not giving adequate encouragement to manufacturers. He also drew attention to the fact that £61,000 was being voted as the cost of inspecting £786,000 worth of material. He was very severe at the expense of the Works Services and pointed out that instead of having a large number of cheap people it would be true economy to have fewer men at better pay.

The War it was thought that the Canadian Winter would interfere seriously with flying training. Consequently a number of the pupils then under training in Canada were sent South to the U.S. Army Aerodrome at Fort Worth in Texas, where it was considered that the weather would be continually favourable to flying. Much to the surprise of those in authority it was found at the end of the Winter that a great deal more flying had been done on the average per pupil by those who remained in Canada and flew ski-shod machines off the snow than by those who were basking in the sun on the Texas prairies.

The actual difference between Winter flying in Canada and Summer flying, or at any rate Spring flying, is shown by the fact that during the first quarter of 1921 the average flying hours per pupil per week was 2.07 whereas in the second quarter the average was 3.26. Thus it may be seen that the Canadian Winter is by no means as unfavourable to flying as one might think.

#### Development Work.

As to the general work which has been done by the Canadian Air Board, several issues of this paper would be necessary if one hoped to deal with it adequately. Therefore one can only give the briefest summary of its accomplishments. First of all it is to be noted that 33 "air harbours" have been licensed by the Air Board up to Sep. 30th, 1921. Of these 7 are Customs harbours.

These are situated, two at Toronto, one at Montreal, one at Virden, Manitoba, one at Deseronto, Ontario, one at Fredericton, New Brunswick, and one at Moose Jaw, Saskatchewan. Incidentally it is curious to note that there is apparently no Customs air harbour in British Columbia where one might expect quite a good deal of coast-wise flying between Vancouver, B.C., and Seattle. Of the total number of air harbours 11 are intended for seaplanes.

Some idea of the total amount of flying in Canada may be gained from the numbers of certificates issued by the Air Board. Up to Sep. 30th there were 58 certificates issued to private pilots and 86 to commercial pilots. There were 151 ground engineers' licences and only one air navigator's licence. Of registered aircraft there were 58 civil machines, 30 Government machines on Civil Service and 59 Canadian Air Force machines. It will be of interest to give some idea of the work done by the Air Board stations apart from the training of war personnel at Camp Borden.—C. G. G.

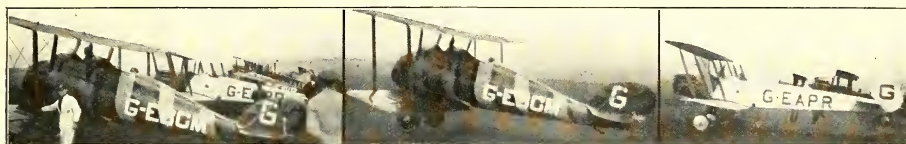
(To be continued.)

He was then turning to the Works and Buildings Vote under Civil Aviation when the Deputy Chairman pointed out that they were not dealing with Vote 8, Civil Aviation. Mr. Raper then ceased speaking on the understanding that there would be a further discussion on the latter points at a later date. Presumably a date will be given for this discussion when Parliament reassembles.

Mr. G. LOCKER-LAMSON wanted to know why the Air Ministry was asking for 1,000 more men than had been recommended by the Geddes Committee. [Apparently he does not recognise that the addition of a few men to the Air Force makes possible the reduction of a very much greater number of men in the Navy and Army.] He also wanted to know why provision was made for two Air Marshals and an increase in the number of officers of high rank when the number of men was reduced. Particularly he wanted to know why the R.A.F. wanted three more Chaplains "unless the Air Force is becoming more irreligious since last year."

Cmdr. BELLAIRS pleaded for co-ordination between the three Services. He gave voice to the usual fallacy that the life of an aviator (whom he called "airman") in the air is very short and suggested that officers who could no longer fly should have the opportunity of taking Naval or Military commands and of rising to Admirals or Generals and bringing their air knowledge to the Naval and Military side.

Viscount CURZON also considered that the Air Ministry was not carrying out the recommendations of the Geddes Committee. He wanted to know why the R.A.F. had sick quarters of their own, specially mentioning Lee-on-Solent which is next door to Haslar where there is a Naval hospital fully equipped. [One wonders whether Viscount Curzon has ever had any experience of Naval hospitals. Judging by the experience of certain of one's friends at Haslar and Chatham during the War one would certainly prefer the attentions of a St. John's Ambulance pupil to the best efforts of any Naval hospital. One recalls in this connection a thank-offering in the little Sanctuary of Notre Dame de Lâchet in the Alpes Maritimes from one who had survived an operation by surgeons of the French Navy at Toulon. It would seem that the Navies of all nations have a curious likeness. Heaven forbid that officers or men of the R.A.F.



GOING! GOING!! GONE!!!—The Parnall "Panther" and the Avro "Viper" getting under way at Croydon on Easter Monday.

should have to be committed to the medical side of the Navy. It is quite bad enough that those who serve in aircraft carriers should be under Naval command.]

Viscount Curzon also asked what was to happen to the R.A.F. officer when he is past flying. [It seems worth while therefore to reiterate the statement that officers will have left the R.A.F. on account of being too old for their rank before they are past flying.]

Lieut.-Comdr. KENWORTHY moved to reduce the Vote on the grounds that the Air Force was costing too much and that we had aircraft in Constantinople and Iraq where we had no business to be.

Major BARNES seconded the amendment also on grounds of supposed economy. [Which is as if one reduced the police force on the grounds that the saving of wages would be an economy even if the amount stolen by burglars might be many times greater.]

Mr. ACLAND and Mr. KILEY also spoke.

Capt. GUEST replying to the debate started by saying that he had always found Mr. Raper's intervention helpful. He said that the Ministry would not be reconditioning aeroplanes if it had not been for the extraordinary financial pressure. The reduction in the number of Cadets was in the interests of economy.

Provision had been made for two Air Marshals in order that the permission of the House might be obtained to appoint an officer of that rank to command in Iraq. [It will be remembered that that was suggested as an explanation in THE AEROPLANE when the Estimates were discussed before the Debate. Sir John Salmond is to be congratulated on his forthcoming promotion.]

Further Capt. Guest pointed out that removing rank titles from non-flying officers would do more harm than good. The reduction in the expenses of recruiting was one to which the Air Ministry felt itself forced to submit.

As regards the limited sum to be expended on engines Capt. Guest said that the Air Ministry regretted it quite as much as Mr. Raper. It was forced upon them for reasons of economy. As regards the Works Services, cottages had been built by the Ministry of Health at the stores at Milton

and paid for by the Air Ministry and that it would be impossible to house civilian employees "in anything like the packing cases or crates that the young soldier in times of depression is more ready to put up with." [One would like to know why more civilians, who take no risks, should be better housed than men in the Service who might at least be maintained in comfort when not in danger.] Capt. Guest also regretted the insufficiency of married quarters.

Replying to Mr. Locker-Lampson he said that the increase in pay and allowances was due to the personnel which were being sent to Iraq and Palestine.

As regards the careers of R.A.F. officers he pointed out that they had every chance which a subaltern who joins the Army has of becoming a General. On the questions of hospitals Capt. Guest said that it might equally well have been asked on the Navy Estimates why the Navy did not use the unused sick quarters of the Air Force.

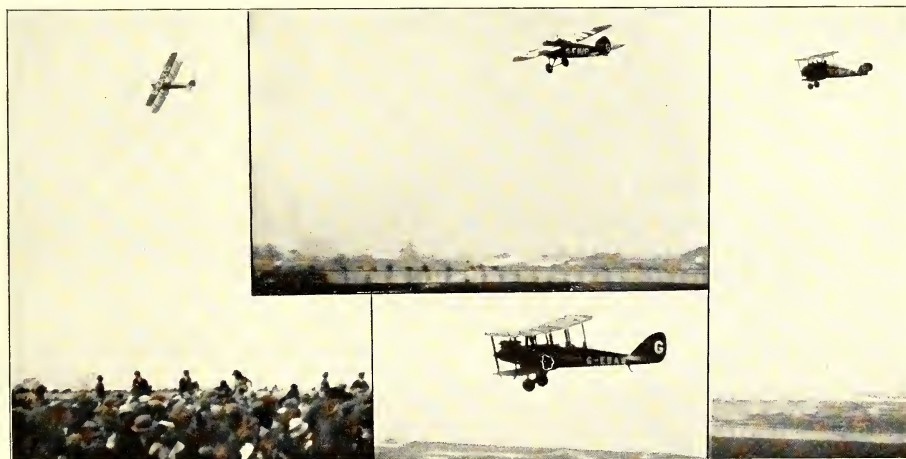
Capt. Guest having disposed satisfactorily of the other people who spoke, the Votes were duly passed.

It is understood that the other Votes in the Air Estimates will be discussed shortly when it seems likely that some points will be raised which the Government may find rather difficult to answer satisfactorily.—C. G. G.

### THE NEXT R.Ae.C. RACES.

It is understood that there is a movement afoot to have the next Croydon Air Race meeting on the Saturday before Whitsun instead of on Whit-sun Monday. The reason given is that it clashes with the Brooklands motormongering meeting.

Doubtless there are one or two members of the Royal Aero Club committee who are so interested in the sport they profess to govern that they cannot leave their beloved trade even on a Bank holiday, but the manner in which those not officially interested in aviation support the Bank Holiday meeting in preference to the Saturday event would seem to indicate that the presence of the public is to be preferred to that of the erring members of the R.Ae.C. committee, at any rate from a monetary outlook.



ROYAL AERO CLUB RACING: At Croydon on Easter Monday, Mr. Stocken on the D.H.9a (Liberty Engine), Mr. Uwins on the Bristol Monoplane (Bristol "Lucifer" Engine), Mr. C. D. Barnard on the D.H.9 (Siddeley "Puma" Engine) and Mr. Muir on the Parnall "Panther" (Bentley Engine).



## R.A.F. INTELLIGENCE.

## R.A.F. Appointments.

Air/Cmdr. B. C. H. Drew, C.M.G., C.B.E., from H.Q., M.E.A., to command Egyptian Group H.Q. 1/1.

Grp/Capt. F. M. Fellowes, D.S.O., from Palestine Group H.Q. to H.Q., M.E.A. 1/1.

Wing/Cmdr. R. P. Ross, D.S.O., A.F.C., to R.A.F. Base, Leuchars, for "Air" Staff duties with C. of C. Atlantic Fleet, in H.M.S. *Queen Elizabeth*. 12/3.

Wing/Cmdr. R. E. C. Peirse, D.S.O., A.F.C., from No. 29 Group H.Q. to R.A.F. Staff College. 1/4.

Wing/Comdr. W. H. Primrose, D.F.C., from No. 6 F.T.S. to School of T.T. (Men). (Superannuary.) On Disbandment of No. 6 F.T.S. 1/4.

Wing/Comdr. H. R. Reid, D.F.C., from No. 6 F.T.S. to School of T.T. (Men). (Superannuary.) On Disbandment of No. 6 F.T.S. 1/4.

Wing/Cmdr. H. A. Williamson, C.M.G., A.F.C., from Air Ministry (Directorate of Equipment) to R.A.F. Depot. (Superannuary.) 1/4.

Wing/Cmdr. P. K. Wise, C.M.G., D.S.O., to command R.A.F. Depot. 3/2.

S/Ldr. F. H. W. Guard, to R.A.F. Depot (Superannuary) on appointment to Short Service Commission for duty with Armoured Car Company (on formation). 3/4.

S/Ldr. M. Henderson, D.S.O., from No. 216 Sqdn. to command No. 47 Sqdn. 13/3.

S/Ldr. R. S. Overton, from Palestine Grp. H.Q. to R.A.F. Depot. (Superannuary.) 17/3.

F/Lt. E. F. Turner, from Air Ministry (Director-General of Supply and Research) to R.A.F. Depot. (Superannuary.) 1/4.

F/Lt. J. R. Howett, from Instrument Design Establishment to No. 209 Sqdn. (Superannuary.) 10/4.

F/Lt. G. H. Reid, D.F.C., from Instrument Design Establishment to R.A.F. Depot. (Superannuary.) To attend School of Military Administration. 10/4.

F/Lt. V. H. Tait, from No. 39 Sqdn. to No. Sqdn. (Superannuary.) 1/4.

F/Lt. L. W. Hall, from Inspector of Recruiting (Liverpool) to No. 5 F.T.S. 13/4.

F/Lt. A. W. Climson, O.B.E., D.S.C., from Inspector of Recruiting (Glasgow) to R.A.F. Depot. (Superannuary.) 1/4.

F/Lt. A. D. Newbury, from Inspector of Recruiting (Birmingham) to I.A.A.D. (Superannuary.) 1/4.

F/Lt. T. Henderson, M.C., A.F.C., from No. 6 F.T.S. to School of T.T. (Men) (Inland Area). (Superannuary.) 1/4.

F/Lt. H. P. Lake, D.S.O., D.F.C., from No. 6 F.T.S. to School of T.T. (Men). (Superannuary.) 1/4.

F/Lt. W. C. Clark, from No. 6 F.T.S. to School of T.T. (Men). (Superannuary.) 1/4.

F/Lt. J. M. Birt, from No. 267 Sqdn. to R.A.F. Depot. (Superannuary.) 25/3. To join 1/4.

F/Lt. A. T. Cooper, from Air Ministry (D. of E.) to R.A.F. Depot. (Superannuary.) 1/4.

F/Lt. E. J. Abner, M.C., from H.Q., M.E.A., to No. 45 Sqdn. 3/3.

F/Lt. N. H. Mulhurst, from H.Q., M.E.A., to No. 216 Sqdn. 3/3.

F/Lt. E. L. P. Morgan, from Aircraft Park (Iraq Group) to Aircraft Depot. (Inland Area). 17/4.

F/Lt. A. Hunter, O.B.E., from Aircraft Depot (India) to R.A.F. Depot. (Superannuary.) 6/3.

F/Lt. M. H. Butler, D.F.C., from R.A.F. Depot to I.A.A.D. 5/4.

## Inter-Services Boxing Tournament.

The International Services Boxing Association has arranged that for the future each Service will in turn be responsible for the organisation of the Inter-Services Boxing Tournament in successive years. This year the responsibility has been delegated to the R.A.F. Boxing Association, and the competitions will be held at Hallow Camp, near Wendover (by permission of Air-Commodore F. R. S. Scarlett, C.B., D.S.O.), on May 3rd and 4th.

There will be four Service entries: Royal Navy, Army, Royal Air Force, and Royal Marines, the last-named coming in as a separate Service for the first time.

The competitions will consist of individual championships for officers (feather, light, welter, middle and heavy weights) and other ranks (all weights).

The Inter-Services Team Championship will be gained by the Service securing the highest number of points in the two classes of individual championships.

The contests will take place in a hangar at Hallow, in which seating accommodation has been provided for nearly 4,000 spectators. There will be two sessions, at 2 p.m. and 8 p.m., on May 3rd, and the finals will be fought at 8 p.m. on the following day.

A special dining-car train will leave Marylebone on May 4th at 6.15 p.m., calling at Harrow, Amman, and Great Missenden, and arriving at Wendover at 7.8. A return train, on which supper may be obtained, leaves Wendover at 11.20, arriving Marylebone 12.5. If sufficient tickets are sold, a similar train will be run for the evening session of the first day. Tickets will be available at Wendover station to convey spectators to Hallow Camp. For the benefit of those proceeding by road, a car enclosure under police supervision is being provided.

The tickets for each session range in price from 1s. to 10s. for ring-side seats. They can be obtained from Messrs. Alfords, 26, Old Bond Street, W.1, and from all Naval Depots, Marine Barracks, Army Commands and Air Force Stations, or on admittance. Tickets for all three sessions may be obtained at reduced rates. Early application for tickets is advisable.

The Central Band of the R.A.F., under the direction of F/O. J. E. Amers (Director of Music), the R.A.F. Band, Hallow, and the massed drums and trumpets of the R.A.F., Hallow, will play during the Tournament.

Any enquiries should be addressed to S/Ldr. J. E. Parkin, M.B.E. (Hon. Sec. Imperial Services Boxing Association), R.A.F. Depot, Uxbridge.

## Henlow Notes.

There were over 100 entries for The Station Shooting Championship on the miniature range which concluded on the 17th inst. The leading scores, highest possible 230, were—F/Lt. Anne, 229, S/M Henderson, 215, AC. Whitt, 215, Sjt. Delaney, 211, AC. Portas, 211, P/Lt. Peach, 202, F/O Scott, 200, AC. Chitty, 200, Grp/Capt. Burdett, 199. In the "shoot off" for 2nd place S/M Henderson scored 222 pts, against AC. Whitt. The prizes were presented by Grp/Capt. Burdett.

The Spring Athletic Sports meeting is being held this week and a most satisfactory entry has been received; doubtless we shall find a lot of new talent has arrived during the past half

year. The card mainly comprises inter-section team relay races.

Our soccer team are maintaining their form right up to the end of the season. The 23rd Kempston Rovers were beaten 8 goals to 0.

Dunstable are the latest victims to our hockey eleven. A return match is to be played on their ground next week.

The Donegal Badge, offered annually by the National Rifle Association, was last week by AC.2 Chitty, Engine Repair Section, with a score of 97 out of 100. We have now 3 Donegal Badge winners on the station.

A Bumble Puppy post has made its appearance in the Officers' garden. This looks as though we are seeking further fields to conquer.

They are telling a story of an officer who found his batman wearing his master's best Sunday boots and, bursting with indignation, let forth,—“If I find ye doin’ it again I’ll get you 3 days C.B., and detention with it!” Perhaps he hails from the Emerald Isle.

## R.A.F. Championships at Baghdad.

The R.A.F. Sports Championships took place at the Baghdad West Aerodrome on April 6th.

No. 6 Squadron won the Championship with 22 points, No. 8 Squadron being second with 11 points, and No. 1 Squadron and Aircraft Park both scoring 11 points. Seventy Squadron scored 8 points, 30 Squadron 3 points, and 84 Squadron 2 points.

The result of the 100 yards open was (1) R.A.F., (2) R.A.F., (3) Norfolk Regt., and the 1 mile open (1) Norfolk Regt.

The Veterans' Race was won by Wing/Cmdr. Primrose.

In the M.T. competition the Aircraft Park took one first and two second.

## The late Sir Ross Smith.

A memorial service for the late Sir Ross Smith and Mr. J. M. Bennett was held at the church of St. Clement Danes on Thursday, April 20th.

Among those present were Sir Keith Smith, Brig-General Trotter representing the Prince of Wales, the Hon. F. E. Guest, M.P., Secretary of State for Air, Lord Gorell, Air Marshal Sir Hugh Trenchard, Bart, Air Vice-Marshal Sir J. M. Salmond, Air Vice-Marshal Sir W. G. H. Salmond, representing the Air Ministry and the Royal Air Force, Lt.-Col. F. K. McLean and Air-Comdr. H. E. Perrin representing the Royal Aero Club, Mr. Douglas Vickers, Sir Trevor Dawson, Sir Vincent Caillard, Lt.-Col. W. C. Symon, Mr. Percy Grant, Mr. W. F. Saddler, Capt. P. D. Acland, Brig-General W. D. Caddell, Mr. Percy Maxwell-Muller, Mr. R. K. Pierson, Capt. S. Cockerell, Capt. F. C. Broome, representing Vickers Ltd., Sir Harry Brittain, Mr. George Pate, Mr. G. S. Wilkins, representing D. Napier & Son, and many others.

On Saturday, April 22nd, a memorial service was held at Weybridge in the erecting shop of Vickers Ltd., attended by the personnel of the Aviation Department of Vickers Ltd.

## Personal Notices.

## DEATHS.

HYDES.—On April 16th, in London, after an operation, Capt. Donald C. Hydes, late London Scottish, Scaforth Highlanders, and R.A.F., the eldest son of Mr. and Mrs. Horace Hydes, late of Tebbington.

PIDSL.—Accidentally killed on April 24th at Donibristle, N.B., George William Rendall Pidsley, R.A.F., aged 26.

## ENGAGEMENTS.

HODGES—STEWART.—The engagement is announced between Capt. A. G. Hodges, Northants and R.A.F., elder son of the Rev. and Mrs. H. A. Hodges, of the Vicarage, Barrow-on-Trent, and Ellen, only daughter of Mr. and Mrs. James Stirling Stewart, of Ayrshire, and the Argentine.

## BIRTHS.

KELLY.—On April 7th, at Malta, to Kathleen (nee Knox), wife of S/Ldr. T. J. Kelly, M.C., R.A.F. Medical Service—a daughter.

LALE.—On April 21st, at 6, Lyndhurst Avenue, Cliftonville, Margate, the wife of F/Lt. H. P. Lale, D.S.O., D.F.C., R.A.F.—a daughter.

MOFFATT.—On April 15th, at Nunfield House, Newington, Kent, the wife of F/Lt. A. McK. Moffatt, R.A.F.—a son.

ROWLEY.—On April 10th, at 1, Wyles Road, Chatham, to Hilda (nee Stigant), the wife of S/Ldr. H. E. Rowley, R.A.F.—a daughter.

TROTT.—On April 7th, at Coomroye, Exeter, to Gladys, wife of F/Lt. F. W. Trott, O.B.E., M.C., R.A.F.—a daughter.

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The Liquidators of the Sopwith Aviation Company, of Kingston-on-Thames, intimate that they are prepared to consider any reasonable offer for a few complete aeroplanes which they have in stock. These comprise the "Antelope," 300 h.p. Suiza, which won second prize in the Air Ministry competition in 1920; several three-seater "Gnus," 110 h.p. Le Rhône; and a two-seater "Dove," 80 h.p. Le Rhône. The "Antelope" would make an excellent cross-country touring machine, or a supplementary machine for an air line, the "Gnus" are particularly suitable for Joy-ride work, and the "Dove" is essentially a machine for a private owner. One gatcher that no reasonable offer will be refused.



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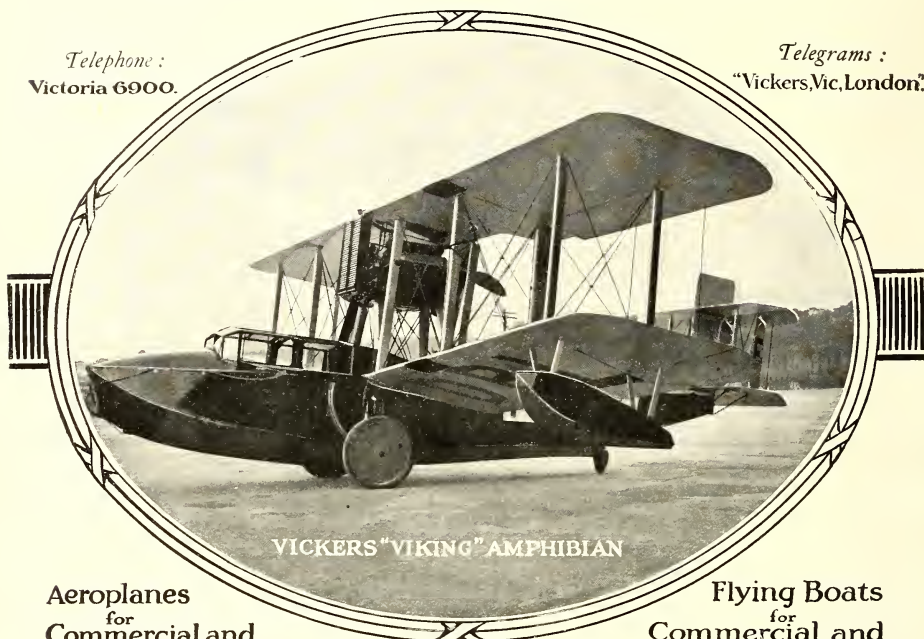
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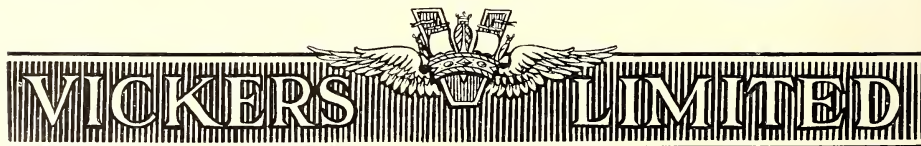
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## THE WEEKLY COMMENTARY.

There is given below an account and an appreciation of the really excellent attempt made by two Portuguese officers to fly from Lisbon to Rio de Janeiro on a Fairey seaplane.

A correspondent under the pseudonym of "Dynamikos" criticises in no kindly manner the attitude of the powers that be in Civil Aviation towards the development of aircraft wireless. He suggests that this development has been severely hampered by the obtuseness of those whom he criticises.

A very interesting and promising type of Crash and Fireproof tank, developed by Commander F. M. Boothby, and tested with very excellent results in the recent Air Ministry Competition is described in this issue.

A brief account of the general nature of the very important engine competition which is to be held in France during 1924 is given hereafter. Unless the French exchange deteriorates considerably in the interval, British engine manufacturers should certainly find it worth their while to take part in these tests.

## THE SOUTH ATLANTIC FLIGHT.

The opening stages of the attempt made by Capitao Tenente (Commander) Saccadura-Cabral, and Captain Gago-Continho, of the Portuguese Navy, to fly from Lisbon to Rio de Janeiro, have already been briefly recorded in THE AEROPLANE.

It will be remembered that the journey was begun from Lisbon at 07.00 hrs. on March 30th, and that the machine reached Las Palmas, in the Canary Isles, at 15.00 hrs., having covered the 710 miles in 8 hours. There the flight was interrupted for several days. On April 5th the flight to St. Vincent in the Cape Verde Isles was completed, the distance of 845 miles being flown in some 9 hours.

Heavy gales blew at St. Vincent for the next 12 days, but on April 17th the weather changed. The machine was flown to Porto Praia, at the extreme southern end of the Cape Verde Islands, where it was filled up, and whence it departed on the next morning.

It was hoped that it would be possible to reach the island of Fernando Noronha, which is within 200 miles of the mainland of Brazil, but a Portuguese cruiser was stationed just off the St. Paul's Rocks, a group of very small islands just north of the Equator and some 250 miles short of the full stage, in order that if it were found impossible to complete the stage the night might be spent there.

From Porto Praia to St. Paul's is roughly 1,000 miles; the complete stage to Fernando Noronha is about 1,250 miles.

In the region between the Cape Verde Islands and the Equator the prevailing wind—and it is a wind which can be relied on with fair certainty—is north-easterly, and therefore more or less behind a machine making this trip. But in a belt which extends somewhat to the north of the Equator there

is a prevalent wind from the south-east, across and to some extent ahead of the course. It would appear that the machine ran into this wind some considerable time before reaching St. Paul's, with the result that the machine did not arrive at that point till 18.00 hrs. in the evening, and that by that time the pilot was tired out.

It was in any case impossible to reach Fernando Noronha before dark. It was therefore decided to land at St. Paul's and spend the night on the cruiser.

Unfortunately in landing the machine was damaged—it is said owing to a cross-wind landing—and it was therefore impossible to continue the flight.

It is now announced that another seaplane—a standard Fairey 3D—is being dispatched to St. Paul's and that Commander Saccadura and his navigator Capt. Gago-Continho will complete the voyage on its arrival.

Despite the unfortunate accident at St. Paul's, this performance is extremely creditable to all concerned.

The three main stages, of which the shortest is over 700 miles, all represent very considerable achievements, particularly when it is recollected that they are made out of sight of land, and that the terminals in each case are quite small groups of islands. The last stage—of just on 1,000 miles, terminating on a group of rocks whose total area is about 20 acres, with no other land within 200 miles or more—must be regarded as an extremely fine piece of accurate navigation, particularly considering the very great strain necessarily imposed by something about 12 hours' continuous flying, all of it within the tropics.

Capitao Tenente Saccadura-Cabral, the pilot of the expedi-



A NEAT ALIGHTING.—Lt.-Col. Nicholl, D.S.O., D.S.C., on the cross-Atlantic Fairey, making one of his typically neat alightings on Southampton Water. Note the extra petrol-tanks under the wings, which, with extra internal tanks, gave the machine a range of well over 1,000 miles. Eventually the tanks were put in the floats.



tion, has previously distinguished himself by his flight from Calshot to Lisbon, and from Lisbon to Madeira, in an F.3 flying-boat which was purchased by the Portuguese Navy after having been reconditioned and equipped by the Fairey Aviation Company at their Hamble works.

Senior Saccadura succeeded in gaining the support of his Government in his effort to fly the South Atlantic to Brazil, and for this purpose a definitely limited sum was placed at his sole disposal to cover the expenses of the journey. In his search for a suitable machine he visited the leading aircraft factories of Europe, and after consideration of all the proposals made to him by them decided to entrust the manufacture of the machine to the firm who had equipped the F.3 which he had used on his previous journeys.

The order to build the machine was given to the Fairey Aviation Company under a strict guarantee that the machine should be completed and flown, at the specified load, and should show the specified performance within three months of the date of the order. This guarantee was fulfilled to the day.

Some illustrations and a description of this machine have already appeared in *THE AEROPLANE*. It may be recalled, however, that it is a modification of the Standard Fairey 3D type, fitted with enlarged floats, increased wing span, and with fuel tanks for 18 hours' flight at cruising speed.

The span is 62 ft., the total loaded weight is 7,250 lbs., and as the engine is a Rolls-Royce of 360 h.p., the weight per h.p. is over 20 lbs.

Of this total the disposable weight is 3,100 lbs. At this weight the machine handles well both on the water and in the air, has a top speed of 95 m.p.h., and an initial climb of 750 ft. per min.

## WIRELESS AT THE AIR CONFERENCE.

By "DYNAMIKOS."

In spite of what corrosative critics may say, there are at least a few reasons why the recent Air Conference may be voted a success. In the first place I pride myself on having detected a certain amount of intelligent opinion lurking amid the feast of flapdoodle with which I was regaled in connection with some subjects under discussion. Secondly, in connection with those subjects in the treatment of which the maximum amount of intelligence was revealed, there is abundant evidence that some of the speakers had been looking up back numbers of *THE AEROPLANE*. Also, of course, it is a matter for congratulation that no one was carried out dead, or maimed, or in any other way inconvenienced.

An impatient reader will say that this hasn't much to do with the subject of Wireless. That's just the point. Neither did the Air Conference. Most of the remarks that were made in relation to wireless were of the 1914 model. "The Study of Directional Wireless is being steadily pressed forward," said one speaker. "Important steps have also been taken to facilitate night flying," said another. "Rats," say I. I should probably be tempted to say something more personal ("Rabbits," for instance, or "Donkeys") were it not for the fact that one person at least did talk intelligently on the subject of wireless.

The remarks of Colonel Bristow represent the only sane attitude that can be taken towards the problem of wireless in commercial machines if the greatest advantage is to be taken of this "great guardian service of aviation." Colonel Bristow gave very liberal praise to the practical assistance rendered by wireless to the needs of commercial aviation in the past. Yet he is not ignorant of the defects in organisation which still exist. The duties of the operator at the base aerodrome are far too diversified under the present administration. They involve conversing with the pilot of a machine in the air, receiving and transmitting weather reports from ground stations, writing out messages, etc. Obviously these duties ought to be sub-divided and individual operators appointed to discharge the most important ones; particularly, as Colonel Bristow pointed out, in view of the expected increase in traffic during the coming summer.

For years past a great deal has been said and written, in terms of surpassing eloquence, on the subject of safety in commercial flight. The real problem to-day, of course, is to convince the public, not that machines can be made safe, but that machines are safe. Yet I am not aware that a single speaker at the Conference gave due recognition to the importance of wireless in this connection. Any shipping company that was in operation during the days when ship wireless was still a luxury will testify to the value of this "wonderful discovery" in giving a sense of security to maritime travel. To those who have the vision to see it this applies even more emphatically to aerial travel. Furthermore, as has been pointed out over and over again, the problem of passengers' comfort is largely psychological. Here, again, wireless can be made to play a part of supreme importance. The sense of safety instilled by the presence of a really efficient wireless equipment will help considerably

The machine is, of course, fitted with the Fairey variable camber gear.

His actual performance on the trip is clear proof of the extremely good qualities of the machine, and of the faultless running of the engine, and both the Fairey Company, and Rolls-Royce Ltd. have every reason to be proud of the results achieved.

The crew of the machine also deserve to be congratulated on an extremely fine performance. Commander Saccadura-Cabral is both an experienced pilot and a capable navigator. This performance marks him as being possessed of a courage and endurance which show him to be a worthy descendant of the Portuguese navigators and explorers of the Middle Ages.

Captain Gago-Coutinho is, one believes, a quite elderly officer who is not a pilot. He has previous experience of aerial navigation—he accompanied Commander Saccadura to Madeira on the F.3—and his subsequent achievements prove that this early success was no mere fluke.

On the Madeira trip a Portuguese ship was stationed half-way along the route as a mark boat. The F.3 sighted the ship and passed it some five miles to the south and east. It is related that when the crew of the F. boat encountered the skipper of the mark boat each reproached the other for being five miles off the proper course. It was eventually discovered that the ship was on the true course from the mouth of the Tagus, while the F. boat had flown from the Tagus above Lisbon, and that each of them was actually on its correct course.

An ordinary marine sextant, together with a drift indicating course corrector designed by Commander Saccadura, used in conjunction with smoke bombs dropped on the water, were used for navigating purposes.

to kill that superlative self-consciousness that springs from timidity and is really the root cause of most of the discomfort experienced by passengers unfamiliar with the joys of flight. Thus the mind of the gentle passenger—freed from the boring influence of over-attention to his or her dear or darling "self"—will be at liberty to enjoy the view, or *THE AEROPLANE*, or whatever other interesting and attractive item may be presented to his or her hard or soft gaze.

But apart altogether from this aspect of the use of wireless there is the far more urgent aspect of the application of wireless to the problem of aerial navigation. I am absolutely at a loss to understand why so little has been done in connection with this important matter. Everything seems to point to the fact that our experts have been at a standstill in this branch of wireless science since the War. Brainy Business Men tell us that the thing is impracticable—yet I take this opportunity of replying: "Bunkum—the thing was practicable in 1917." The truth of the matter is that commercial companies have scarcely looked at the problem. The job is almost entirely out of their hands. They appear to regard the whole question of wireless organisation as a necessary evil. Consequently, after several years have elapsed since machines were first navigated by wireless, one is told to-day that the thing is impracticable!

One will be told, no doubt, that there is a difference between service flying and commercial flying. Exactly. (Thank heavens!) But where are the commercial "heads" who have made this subject a matter of careful personal scrutiny? Has anyone, for instance, seriously investigated the commercial possibility of using light wing coils in machines on the London-Paris route? These coils function as a directive aerial and necessitate the use of a receiving apparatus that is quite small and light. With such an equipment—which can be operated by means of two simple switches—it is the easiest thing in the world to fly direct to any particular wireless transmitting station. Should the wireless station be situated at the aerodrome of destination, a means is thereby provided for conducting machines to their journey's end by the most direct route. There is no question of getting cross-bearings or making laborious calculations on charts or plotting courses, etc. The whole thing is quite simple and straightforward, and can be performed efficiently by any pilot with a grain of intelligence. I know people who did it years ago!

Of course, it will be argued against this and other systems that they are not efficient commercially; in other words, that they will cost a little money without showing an immediate return at a big rate of interest. So long as this is the attitude taken the position may well seem hopeless to those of us who know something of the inertia of the modern Business Man's mind. But I am not without hope. Perhaps someone with a sense of humour will join a Commercial Company one of these days and enquire into the possibilities of the whole subject just for the fun of the thing. Apart from such an occurrence, however, the prospect is indeed bleak.



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## THE BOOTHBY GAS ARMoured TANK.

The Boothby Gas Armoured fuel tank, which gave extraordinarily good results in the recent Air Ministry crash-proof tank tests, is an entirely new departure in aircraft tank construction. The design is based on Commander F. L. M. Boothby's observations that ballast bags dropped from airships did not burst badly on hitting the ground, especially if the bags were not full, combined with the result of tests made to fireproof gas bags by surrounding them with a layer of inert gas.

The tank is a fabric tank, and consists of an inner skin of balloon fabric, lined within with gold-beater's skin, a second container also of fabric, which serves as a safeguard in the event of the inner case leaking, and finally of an outer gas-tight casing filled with cooled exhaust from the engine.

This outer case may be of fabric or three-ply, and it is possible to use the fairing of the fuselage itself as part of this outer casing.

The two inner casings are supported from the fuselage on rubber shock absorbers, and to prevent swaying it is also suspended by light cords. These latter are so light that they will carry away in a crash before damage is done to the casing.

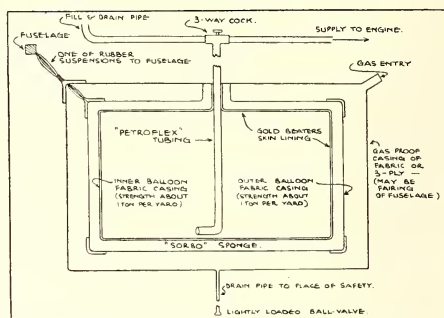
The design of petrol connections for a crash-proof tank presents difficulties, for they are very liable to break in a crash, and a broken petrol pipe may be as dangerous as a punctured tank. In the Boothby tank there is a single sleeve passing through the top of the whole assembly. Into this fits tightly a length of smooth "Petrolflex" tubing which reaches to the bottom of the tank, but which is only friction held in the sleeve, and can therefore pull through to a considerable extent if the tank carries away.

The outer casing is kept filled by exhaust gas taken from the engine through a small pipe long enough to cool the gas. The bottom of the gas compartment has an escape and drain pipe, fitted at its end with a lightly loaded release valve, and leading down to the undercarriage or some such place of safety. Thus the gas case is kept charged with exhaust, and if there is any petrol leakage from the inner casings the petrol is also drained off to a place of safety.

In the latest type of this tank the space between the two inner casings is filled with "Sorbo" sponge, which if punctured as by a bullet will swell on contact with petrol and close the hole.

The tank entered in the Air Ministry competition was not fitted with this sponge filling, and originally the Air Ministry agreed to allow the fairing of the fuselage to be used as a gas casing. The tank was designed to carry the specified quantity of 31.5 gallons, but as this type of tank requires to be only partially full to give the full extent of safety it was actually capable of being filled to over 50 gallons, though it would not then have been crash-proof.

In the preliminary crash tests the tank did not leak at all,



and was quite fit to repeat the test. About a week before the final tests the Air Ministry withdrew the concession that the fuselage fairing might be used as a gas container, and also said that if the tank were capable of containing more than 31.5 gallons it must be disqualified under the rules of the competition. There was not time to design and build new tanks, so extemporised means were taken to reduce the volume, the outer casing was removed, and a rough gas casing was built inside the fuselage. The result was not as good as the original design. The crash-proof qualities were about half those of the original and the fire-proof qualities were small. Nevertheless it stood five rounds of incendiary ammunition and only failed after 10 rounds through one point of aim.

The sketch attached shows the general scheme very clearly. The single Petroflex tube leading out of the tank is connected to a three-way cock, so that one may either fill, drain, or supply the carburettor through it. The tank could be used for gravity feed, after starting a siphon action, or for petrol pump feed.

It may also be used for pressure feed. In this case, owing to the flexible nature of the tank, pressure may be applied outside, thus avoiding the risk of pumping impurities into the petrol container.

Finally it is a distinctly valuable feature that using this construction a crash-proof tank can be built for considerably less than that of the ordinary unprotected tinned steel type. The weight of the crash and fire-proof type can be brought down to practically the same weight as the usual type.

## THE FRENCH ENGINE COMPETITION.

The regulations for the French contest for aero engines which is to be held during 1924 have just been issued.

This contest, which is due to the initiative of the Comité Française de Propagande Aéronautique, is supported by the Under Secretary of State for Aeronautics. The Committee and the French Air Ministry have each assigned a sum of one million francs for the purpose of the competition.

The million allocated by the Government is to provide two prizes each of 300,000 francs for engines of French origin, and the million allocated by the Committee is to be devoted to purchasing for the benefit of the French Government the French manufacturing rights in the engine which is adjudged to be the best. Engines of any origin—except those from ex-enemy countries—are eligible for the competition, but not for the two prizes above mentioned as reserved for French engines.

In the event of the winning engine being of foreign origin, in addition to the sum of one million francs, provision is made for the payment of royalties at a maximum rate of 8,000 francs per engine for the first 100 engines built, decreasing 1,000 francs at each 100 engines, till the 600th, whereafter a uniform maximum royalty of 2,000 francs per engine is payable.

Entries will be received up to Dec. 1st, 1922, by the Commission d'Aviation of the Aero Club of France if accompanied by an entrance fee of 20,000 francs. Entries will be received up to Dec. 1st, 1923, at an entrance fee of 40,000 francs. Foreign competitors will in addition be required to contribute 10,000 francs towards the cost of testing.

Half of the entrance fees will be returned to all competitors who pass the eliminating tests. The special contribution of 10,000 francs from foreign competitors will be returned to those who may withdraw before the official opening of the trials.

Engines must be of the internal combustion type, and of

a normal output of between 350 and 450 h.p. The weight per h.p., including the weight of fuel and oil for 5 hours, must not exceed 3.3 kg. per h.p. The speed of rotation of the airscrew is not to exceed  $\frac{32,000}{\text{V.H.P.}}$  r.p.m.

All engines are to be fitted with a self-starter such that the engine may be started at a distance without turning the engine by hand. This starter alone is to be used for starting during the whole of the trials.

Engines will be required to undergo eliminating trials, including five hours' run on an air brake on the test bed, and two hours' flight on an aeroplane which is to be provided by the entrants.

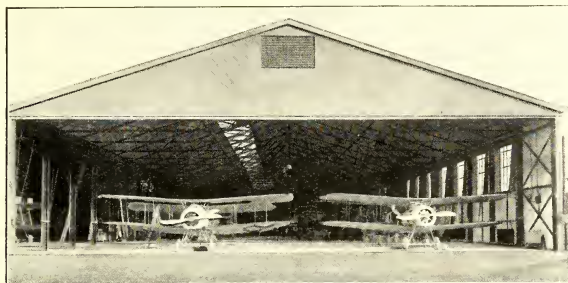
Thereafter the engines will be submitted to an endurance test totalling 240 hours' run in thirty periods of 8 hours each on the test bench. The load is to be an air brake of the airscrew type, supplied by the competitor, and the engine will be mounted on a pivoted test bed, which will allow measurement of the brake h.p.

The total of 240 hours' run is required to be made in not more than 100 days—not more than one run per day—and penalty marks will be awarded for every delay in starting, for every stoppage during a run, for every day taken to complete the tests in excess of the possible minimum of 30 days, and for every repair and replacement made during the whole period. Any individual run may be annulled on account of delays in starting, stoppages, or failure to develop the required power.

The whole endurance test may be annulled if more than 10 such runs have been annulled, if more than 30 days elapse between any two consecutive 8 hour runs, or if the total repairs or replacements exceed certain specified limits.

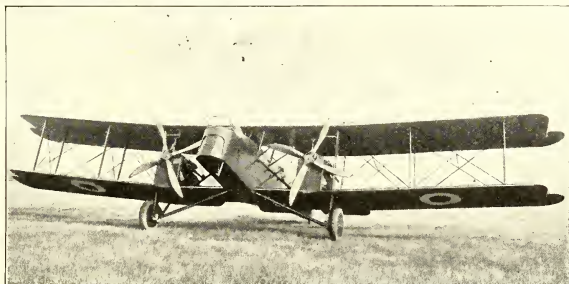
A second attempt may be made, but is to be completed in 80 instead of 100 days. Such a second attempt is attended by penalty marks.





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Marks are to be awarded for the weight per h.p., with five hours' fuel and oil, as determined from the actual consumption and power developed during the trials. If the weight per h.p. so computed is more than three kg. per h.p. the marks are penalties; if less, they are set against penalties.

Penalties are inflicted for the air resistance of the engine, which is taken as proportional to the area inside the smallest convex contour which will entirely enclose the projection of the motor on a plane normal to the airscrew axis. This area, divided by the normal full power of the engine, is the basis of the penalty marks.

The sum of all penalties, less any good marks for low weight per h.p., will serve to classify the competitors, the lowest total being that of the winner. One of the 300,000 franc prizes for French engines will be awarded on this same basis. The second 300,000 franc prize will go to the French engine which gives the best results on the two points of weight per h.p. and head resistance.

Complete details of the rules, conditions of entry, and so forth, may be obtained on application to the Commission d'Aviation de l'Aéro Club de France, 35, Rue François 1er, Paris.

The system of penalty marking laid down in the regulations for this competition has certain very interesting and somewhat ingenious features. The system has obviously been devised with the intention of eliminating so far as is possible the effects of accidental ill-chance on the prospects of a good engine, and of penalising very severely any form of consistent ill behaviour.

Penalties are imposed for all delays in starting, and for stops during test runs. These penalties vary with the time of delay or stop. If the delay does not exceed one hour, if there is not more than one stop in a run, and that stop is of less than one hour the penalty on the score of stop or delay goes no further. But if either stop or delay exceed one hour, or if there is more than one stop, the run is annulled. There is a penalty for annulment, and in addition a further penalty for the extra day taken to complete the 240 hours' total.

And if the stop or delay involves the repair or replacement of any part, there is a penalty for that repair or replacement. This penalty is inflicted for repairs, etc., even if it does not lead to delay or stoppage. The penalties are thus cumulative, and increase as their effects become more serious.

But the method of penalising for repair and replacements is extremely ingenious. There is a basic scale for these, the penalties increasing with the time needed to carry out the work, whether the work is of a nature which allows immediate resumption of the test, or necessitates "tuning up" and preliminary running before continuance of the tests. Also generally the penalties for the replacement or repair of an isolated piece are less than are those for a complete unit. That is, it is cheaper to replace a big-end bush than a complete connecting rod unit, and it is cheaper to replace an accessory unit such as a magneto than an essential of the engine such as a complete cylinder. This is quite apart from penalties which arise from the delay in carrying out the change.

But this basic scale applies only to the first time of repairing or changing a given unit or type of unit. Wherever a part has already been changed or repaired, the penalty for change or repair to a similar part (not necessarily the same part) is to be that in the scale, multiplied by the total number of changes or repairs to the same part or type of part. From this rule plugs and valves are excepted. In their case the penalty is imposed plus the number of preceding replacements.

The effect of this rule is that the tenth defective water or oil joint to be replaced during the tests will involve a direct penalty as great as that due to the changing of a crankshaft or cylinder. Thus silly little failures due to faulty design or workmanship which recur continually are very heavily penalised, while a more serious breakage which may be due to an undiscoverable flaw or to some accidental mischance does not necessarily put an engine out of the contest.

### THE NAPIER "CUB."

When the preliminary notice as to the existence of the 1,000-h.p. Napier engine, known as the "Cub," was first published in this journal, it was not permissible to give any accurate information as to the dimensions, etc., of the engine.

The engine has now passed satisfactorily through bench tests, and a sample engine is to be installed in an experimental machine now under construction for the R.A.F.

The makers of the "Cub," D. Napier and Son Ltd., have now published a general specification of the engine, giving the main dimensions, and this is reproduced herewith.

**SPECIFICATION OF 1,000-H.P. NAPIER "CUB" AERO ENGINE.**

Number of cylinders—16.

Arrangement of cylinders—4 lines of 4 cranks.

Bore—6½ in. (158.75 mm.).

Stroke—7½ in. (190.50 mm.).

Normal h.p. and speed—1,000 h.p. at 1,800 r.p.m.

Total swept volume of engine—3,687.6 cubic inches.

Compression ratio—5.2 to 1.

Direction of rotation of crank—Clockwise viewed from air-screw end.

Direction of rotation of airscrew—Clockwise viewed from airscrew end.

Normal speed of airscrew—752 r.p.m.

Type of gear reduction to airscrew—Spur gearing.

Lubrication system—Forced to all bearings.

Type of carburetters—Quadruple carburettor cast with oil pump.

Mixture control—Hand control.

Fuel consumption per hour—1 pint per h.p. hour.

Type of ignition—Four magnetos.

Direction of rotation of revolution counter drive facing shaft on engine—Clockwise.

Starting arrangements—Distributor provided for gas starter.

### A TRIBUTE TO THE "PUMA."

The following letter has been received by Armstrong-Siddeley Motors Ltd. from Mr. Alan Cobham, the well-known pilot of De Havilland aeroplanes:—

Dear Sirs,—After over a thousand hours flying behind a Siddeley "Puma" engine I have never experienced serious trouble from the engine itself and only on rare occasions have its accessories required adjustment or repair. Throughout my European tours on a D.H.9c the continual efficient service given by the "Puma" engine has been remarkable, and its simplicity, accessibility, and reliability have been the subject of much favourable comment in every country I have visited, where also the fact that I travelled unaccompanied by a skilled mechanic created considerable astonishment. This is a striking testimony to its excellence as a one-man engine.

March 25th, 1922.

[Very few people realise quite how much 1,000 hours of flying really means. Flying three hours a day it will require 333 days—or excluding Sundays one year and over three weeks—to total 1,000 hours, and in that time a D.H.9c should cover 85,000-90,000 miles. Yet there are those who compare the modern aero engine with the car engine to the detriment of the former.]

### A CHANGE OF ADDRESS.

Capt. A. S. Keep, of the Westland Aircraft Company, is now established as the London representative of that enterprising firm, and has his headquarters in the offices of Petters Ltd., at 75b, Queen Victoria Street, E.C.4. His advent to the metropolis should be a distinct benefit to the firm's business, for Captain Keep is popular with all and he knows his job.

### A TEXT BOOK ON AERO ENGINES.

The aeroplane engine has never yet been adequately dealt with in any discoverable text-book. This is inevitably the case because the development of this specialised form of prime mover has proceeded at a very rapid rate, and has been carried out as the result of improvements and modifications in widely separated fields of engineering, applied and theoretical. Applied thermodynamics, metallurgy, and machine shop practice have all played their part in that development, and data relating to experiments affecting the problem have come from widely different sources and in widely different forms.

In the book here considered Professor L. S. Marks has compiled an extraordinarily well-balanced statement of the present state of knowledge as it bears on the practical design of aircraft engines. The problem of the aero engine is considered from all its aspects except that of the actual manufacturing processes involved, and the book even includes a short, but quite excellent, chapter on the dynamics of the aeroplane and the airscrew as they affect the qualities needed in an aero engine.

The thermodynamics of the internal combustion engine and the dynamic problems of balance are dealt with briefly, but clearly and accurately. Thereafter a very excellently selected series of statistics and of drawings of the details of construction of representative types of proved engines bring the reader into direct contact with the aero engine in being.

Fuels and their qualities, the carburettor, the magneto, lubrication and cooling systems, reduction gears, the subject of the supercharged engine are all dealt with clearly and in the light of the most modern practice.

The author is to be congratulated on having produced a work of such wide scope, compressed into a small space, and so remarkably up to date. It is certainly the best book of its type one has so far met.

\* "The Airplane Engine." By Lionel S. Marks, B.Sc. Professor of Mechanical Engineering, Harvard University. (Published by the McGraw Hill Book Co. Inc. New York and London. Price 30s. net.)

## AN APPRECIATION OF THE DH9c.

The following is an extract from a letter recently received from the Compañía Española de Tráfico Aéreo—the Spanish aerial transport company which is running the Seville-Larache Air Line:—

“On the occasion of the completion of the first three months during which we have been operating the first Spanish air service between Sevilla and Larache, we should like to take the opportunity to place on record our satisfaction with the material and personnel provided by you. Using these exclusively, you will be pleased to hear that we have, since the inauguration of our service on October 15th, 1921, till January 15th, 1922, successfully completed 85 return journeys. This represents 42,500 kilometres covered without difficulty or mishap and an incalculable saving in time and increase in regularity over the existing means of transport.”

The above company is using DH9c machines exclusively supplied by :

**The De Havilland Aircraft Co., Ltd.,**  
**Stag Lane Aerodrome, Edgware, Middlesex, England.**

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# COMMERCIAL AERONAUTICS

## AND CIVIL AERIAL TRANSPORT.

### THE UNITED KINGDOM OF GREAT BRITAIN AND IRELAND.

#### CONTINENTAL ARRIVALS AND DEPARTURES.

[The following table of arrivals at and departures from the British Air Ports is compiled on the following system:—First comes the initials of the Air Line; next the type of machine; next the international number of the machine; next the ports of departure and destination; next the times of departure and arrival; next the cargo, whether goods (G) and/or mails (M); next the number of passengers; and finally the name of the pilot and number of mechanics, if any.]

ABBREVIATIONS:—A.D.—Aircraft Disposal Co. B.—Berkshire Aviation Co. B.C.—Bristol Aeroplane Co. C.A.—De Havilland Aircraft Co. G.E.—Compagnie des Grands Express Aériens. H.P.—Handley Page Transport Ltd. I.L.—Instone Air Line K.L.—Konink-Like Luchtvaart Maatschappij. L.A.—Leatherhead Aviation Services. M.—Messageries Aériennes. M.W.—Marconi Wireless Telegraph Co. Ltd. P.O.—Privately owned. P.L.—Pettis Ltd. S.F.—Surrey Flying Service. S.N.—Syndicat National pour l'Etude des Transports Aériens (S.N.E.T.A.).

#### The London Terminal Aerodrome, Croydon. (Telephone: Croydon 2720.)

##### APRIL 17th:

M.A., Breguet, F-CMAK, London-Paris, 07:28-16:00, G, Nil, Paillé.  
I.L., DH18, G-EAWW, London-Paris, 10:05-12:15, G.M., Nil, Jones.  
G.E., Goliath, F-HMY, London-Paris, 11:40-14:50, G, 3, Chalmel & I.  
H.P., Bristol, G-EAWY, London-Paris, 12:35-14:30, G, Nil, Olley & I.  
M.A., Goliath, F-ADAY, Ldn-Paris, 12:41-15:05, G, Nil, Charpentier & I.  
I.L., DH18, G-EARO, London-Paris, 15:10-17:30, Nil, Shepperson.  
I.L., Vimy, G-EASL, Paris-London, 10:35-14:45, G, 4, Brady.  
H.P., H.P., G-EATH, Paris-London, 12:15-16:15, Nil, 7, Wilcockson & I.  
M.A., Goliath, F-FARI, Paris-London, 13:55-10:45, G.M., 6, Dorr & I.  
I.L., DH18, G-EAWW, Paris-London, 15:10-18:45, Nil, 4, Jones.

##### APRIL 18th:

I.L., DH4, G-EAMU, London-Paris, 06:50-08:45, G, Nil, Powell.  
M.A., Breguet, F-CMAB, London-Paris, 06:59-09:05, G, Nil, Delage.  
D.A., DH34, G-EBSB, London-Paris, 09:53-11:45, G.M., Nil, Herne.  
K.L., Fokker, H-NABO, London-Adm., 10:05-14:15, G, 1, Geyssendorfer.  
I.L., DH18, G-EAWW, London-Paris, 10:17-12:10, G, 3, Robins.  
H.P., DH4, G-EAWH, London-Paris, 10:14-14:57, G.M., 1, Carter.  
M.A., Breguet, F-ADAM, London-Paris, 14:15-16:35, G, Nil, Kuyvenuc.  
M.A., Spad, F-ADAE, Paris-London, 09:40-14:50, G.M., Nil, Robyn.  
I.L., DH18, G-EARO, Paris-London, 10:00-13:25, Nil, 3, Shepperson.  
I.L., DH4, G-EAMU, Paris-London, 12:35-14:24, G, 1, Powell.  
H.P., Bristol, G-EAWY, Paris-London, 12:12-14:30, G, 2, Olley.  
G.E., Goliath, F-ADDT, Paris-London, 12:45-16:30, G, 3, Favreau & I.  
K.L., Fokker, H-NABO, Adm-London, 14:47-10:40 G.M., 3, Hoffstra.  
D.A., DH34, G-EBSB, Paris-London, 15:19-18:28, Nil, 1, Herne.

##### APRIL 19th:

I.L., DH4, G-EAMU, London-Paris, 06:58-09:45, G, Nil, Courtney.  
M.A., Spad, F-CMCF, London-Paris, 07:00-09:50, G, Nil, Perignon.  
D.A., DH34, G-EBSB, London-Paris, 09:40-11:00, M, Nil, Robinson.  
K.L., Fokker, H-NABO, London-Adm., 10:00-15:20, G, 1, Hofstra.  
I.L., Vimy, G-EASL, London-Paris, 10:10-12:55, G.M., Nil, Brady.  
G.E., Goliath, F-GEAC, London-Paris, 11:45-14:10, G, 2, Geyssendorfer & I.  
H.P., Bristol, G-EAWY, Ldn-Paris, 12:12-14:40, G.M., 2, Wilcockson & I.  
M.A., Goliath, F-FARI, Paris-London, 12:50-15:45, G, Nil, Dorr & I.  
I.L., DH4, G-EAMU, Paris-London, 11:00-13:30, G, Nil, Courtney.  
I.L., DH18, G-EAWW, Paris-London, 10:05-12:57, Nil, 3, Robins.  
H.P., DH4, G-EAWH, Paris-London, 11:58-14:35, G, 2, Carter.  
K.L., Fokker, H-NABO, Adm-Ldn, 13:45-17:30, G.M., Nil, Geyssendorfer.  
G.E., Goliath, F-HMY, Paris-London, 12:50-18:05, G, 2, Chalmel & I.  
I.L., Vimy, G-EASL, Paris-London, 15:00-18:15, G, 6, Brady.  
K.L., Fokker, H-NABO, R'dm-Ldn, 15:05-17:40, G.M., Nil, Van der Hoop.  
D.A., DH34, G-EBSB, Paris-London, 15:50-18:45, G, Nil, Robinson.

##### APRIL 20th:

I.L., DH18, G-EARO, London-Paris, 11:22-13:50, G.M., 1, Powell.  
H.P., H.P., G-EATH, London-Adm., 12:37-16:00, G, 2, Geyssendorfer & I.  
K.L., Fokker, H-NABO, London-Adm., 12:45-14:50, G, 3, Hinchliffe & I.  
D.A., DH34, G-EBSB, London-Paris, 12:56-15:30, G, Nil, Chalmel & I.  
M.A., Spad, F-ADAE, London-Paris, 12:58-18:05, G, 2, Geyssendorfer & I.  
D.H., DH4, G-EABX, London-Paris, 17:10-19:30, Nil, 2, Barnard.  
M.A., Breguet, F-CMAG, Paris-London, 07:35-10:24, G.M., Nil, Portal.  
G.E., Goliath, F-GEAC, Paris-London, 11:47-15:20, G, 2, Gastoux & I.  
H.P., Bristol, G-EAWY, Paris-London, 12:15-15:05, G, 2, Wilcockson & I.  
M.A., Goliath, F-ADAO, Paris-London, 13:23-17:32, G.M., 2, Le Men & I.  
K.L., Fokker, H-NABO, Adm-London, 14:05-18:15, G.M., 3, Hofstra & I.  
M.A., Breguet, F-CMAG, Paris-London, 14:45-18:40, G, 2, Robyn.  
I.L., DH18, G-EARO, Paris-London, 15:15-17:55, G, 3, Powell.  
D.A., DH34, G-EBSB, Paris-London, 16:10-18:45, G, 1, Robinson & I.

##### APRIL 21st:

I.L., DH4, G-EAMU, London-Paris, 06:46-09:00, G, Nil, Holmes.  
M.A., Breguet, F-CMAG, London-Paris, 09:11-11:50, G, Nil, Hofstra.  
K.L., Fokker, H-NABO, London-Adm., 10:00-14:10, G.M., 2, Hofstra.  
I.L., Vimy, G-EASL, London-Paris, 10:10-13:30, G.M., 1, Jones.  
G.E., Goliath, F-HMY, London-Paris, 12:07-14:55, G, Nil, Gastoux & I.  
H.P., DH4, G-EAWH, London-Paris, 12:15-14:35, M, 2, Carter.  
D.A., DH34, G-EBSB, London-Paris, 12:40-14:45, G, 3, Herne & I.  
M.A., Goliath, F-ADCA, London-Paris, 13:10-15:55, G, Nil, Le Men & I.  
M.A., Breguet, F-CMAK, Paris-London, 07:25-10:25, G, Nil, Paillé.

I.L., DH4, G-EAMU, Paris-London, 11:35-13:45, G, Nil, Holmes.  
G.E., Goliath, F-ADDT, Paris-London, 12:00-14:45, G, 1, Favreau & I.  
H.P., H.P., G-EATH, Paris-London, 13:25-16:25, G, 2, McIntosh & I.  
M.A., Goliath, F-ADAY, Paris-London, 13:45-16:45, G.M., 4, Le Sec & I.  
K.L., Fokker, H-NABO, Adm-Ldn, 13:40-17:30, G.M., 1, Geyssendorfer.  
I.L., Vimy, G-EASL, Paris-London, 14:55-17:30, G, 2, Jones.  
D.A., DH34, G-EBSB, Paris-London, 15:50-18:50, G, 1, Herne & I.

##### APRIL 22nd:

I.L., DH4, G-EAMU, London-Paris, 07:10-09:40, G, Nil, Courtney.  
I.L., DH18, G-EAWW, London-Paris, 12:00-13:40, G.M., 2, Shepperson.  
K.L., Fokker, H-NABO, London-Adm., 12:40-18:50, G.M., 3, Geyssendorfer.  
H.P., H.P., G-EATH, London-Adm., 12:50-18:50, G.M., 3, McIntosh & I.  
D.A., DH34, G-EBSB, London-Paris, 12:55-16:00, G, 1, Robertson.  
M.A., Goliath, F-ADAY, London-Paris, 13:04-16:05, G, Nil, Le Sec & I.  
G.E., Goliath, F-GEAC, London-Paris, 13:07-16:00, G, 1, Favreau & I.  
I.L., DH4, G-EAMU, London-Brussels, 16:03-18:15, Nil, 2, Barnard.  
M.A., Breguet, F-CMAG, Paris-London, 07:10-10:15, G.M., Nil, Delage.  
I.L., DH4, G-EAMU, Paris-London, 11:00-13:25, Nil, Nil, Courtney.  
H.P., DH4, G-EAWH, Paris-London, 12:40-15:20, Nil, 2, Carter.  
M.A., Goliath, F-HMY, Paris-London, 13:45-16:40, G.M., 2, Compot.  
D.H., DH5, G-EABX, Brussels-London, 15:37-18:17, Nil, 3, Barnard.  
D.A., DH34, G-EBSB, Paris-London, 16:45-19:37, G, 5, Robertson.

##### APRIL 23rd:

I.L., DH18, G-EARO, London-Paris, 10:35-12:57, G, 3, Brady.  
D.A., DH34, G-EBSB, London-Paris, 11:10-13:15, Nil, 3, Herne.  
H.P., Bristol, G-EAWY, London-Paris, 12:08-14:25, G, 3, Olley.  
M.A., Goliath, F-HMY, London-Paris, 12:45-15:05, G, 3, Nil, Compot.  
M.A., Breguet, F-CMAB, Paris-London, 07:00-10:17, G, Nil, Briere.  
H.P., H.P., G-EATH, Paris-London, 11:55-15:12, G, 3, McIntosh & I.  
M.A., Spad, F-ADAE, Paris-London, 13:05-16:05, Nil, 1, Challoux.  
D.A., DH34, G-EBSB, Paris-London, 13:55-16:25, Nil, 1, Herne.  
I.L., DH18, G-EAWW, Paris-London, 15:00-17:50, G, 5, Shepperson.  
I.L., DH4, G-EAMU, Brussels-London, 15:10-17:44, Nil, 2, Barnard.  
I.L., DH18, G-EARO, Paris-London, 16:00-18:40, Nil, 3, Brady.

#### Flying by the Aircraft Disposal Co.

April 17th.—D.H.50, "Panther," 10 Martinsys, S.E.50, races (Stocken, Muir, Long, Longdon, Carroll).  
April 18th.—Nil.  
April 19th.—D.H.9, G-EBCE, test (Stocken).  
April 20th.—Avro, G-EBCE, test (Stocken); D.H.9, G-EBCE, left for Brussels (Hays).  
April 21st.—Three Avros, tests, D.H.9, test (Stocken).  
April 22nd.—Nil.

#### Instone Flying at Croydon.

April 17th.—Royal Aero Club Races; E.C. Bristol monoplane from Bristol (Uwins); D.H. 12-Hob, Stag Lane return (Barnard).  
April 18th.—A. V. Roe, Avro to Hamble (Hinkler); S.F., Avro, joy-rides (Muir).  
April 19th.—B.C., monoplane to Bristol (Uwins); S.F., Avro joy-rides (Muir).  
April 20th.—I.L., Vimy, tests (Barnard, Jones, Shepperson); R.Ae.C., Avro, joy-rides (Muir).  
April 21st.—S.F., Avro, joy-rides (Muir); H.P., W.B. from Cripplewood, return (Rogers); I.L., D.H.18, test (Barnard); K.L., Fokker test (Van der Hoop).  
April 22nd.—Nil.  
April 23rd.—I.L., D.H.18, test (Powell); S.F., Avro joy-rides (Muir).

#### Cross-Channel Statistics.

Week ending April 23rd:—  
Machines, 66; Passengers, 171; Crews, 140; Total Personnel, 320  
Corresponding week last year:—  
Machines, 66; Passengers, 183; Crews, 70; Total Personnel, 253  
Corresponding week, 1920:—  
Machines, 44; Passengers, 46; Crews, 46; Total Personnel, 92

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### The London Terminal Aerodrome.

Monday of this week was chiefly taken up by the races, which were fully described last week.

On Wednesday Mr. Stocken was testing for the Aircraft Disposal Company a D.H.9. The following day Mr. Hayns left on this machine for Brussels. On Thursday evening Mr. Stocken had an Avro up for test, doing a wide circuit over West Wickham and Tooting.

The following day he did three tests on an Avro and late in the afternoon he had the not-quite-standard D.H.9 out for test. One hopes to be able to describe this machine in detail.

Mr. Stocken is now contemplating changes on his D.H.9, which he now calls "The Singing Duck" owing to its fine vocal powers. He hopes to clean it up so as to get several more miles per hour out of it for the Whitsun races.

The event of the week was the arrival on Friday of the first of the new Handley Page W.8bs with Rolls-Royce engines. Mr. Rogers brought the machine over from Cricklewood in the afternoon in order to get a new airscrew for the star-board engine. Mr. Payne was in the spare pilot's seat and later on in the evening Mr. Rogers flew it back to Cricklewood and Mr. Payne then took it up to Martlesham.

The next one will be along in about three weeks and the third and fourth shortly after. The third one is the old original W.8 still with the Napier "Lion" engines but with entirely new planes and centre section.

The new W.8b is painted silver outlined in gold and is therefore, as Mr. Coggi points out, a regular gilt-edged security. It was originally outlined in black but it looked too funereal. The old W.8 still remains pea-green and black.

She took off in fine style carrying the same six passengers with whom she arrived, including Mr. Meredith her "trainer," and took in addition Mr. Fitch of the Wireless Section, who found it a quicker method of getting to his home in North London than going by train.

Handley Page Transport have been running the Bristol, the O/400 and the D.H.4a throughout the week. On one occasion Mr. Olley was forced to land on the Bristol in France. In taking off again on the rain-sodden ground the wheels sunk in and the machine stood on its nose, burying one blade of the prop about a foot in the ground. Nothing whatever, including the aircrew, suffered any damage, and after a thorough inspection Mr. Olley took the machine off and completed his journey.

On Friday Mr. O. P. Jones took the Instone "Vimy" to Paris and brought her back in the evening. This was her last trip in her present form. She is to go back to Weybridge where she will be fitted with new wings with a new high lift section. The fuselage is also receiving alterations and an Oleo undercarriage is to be fitted. In fact it seems that there will be little of the old "City of London" left. The machine celebrates her second birthday next Sunday, having been delivered at Croydon on April 30th, 1920.

The early morning newspaper service to Paris which is being run by the I.A.L. at 06.30 hrs has been working well and regularly and it is hoped to run from Paris to London with French papers almost at once. For this purpose, two four-seater Westland Limousines with "Falcon" Rolls-Royces have been bought by the firm. Some more D.H.34s are also on order and the first of the Vickers "Vulcan" eight-seaters will be ready for test on Friday.

It is hoped to start up a daily service to Brussels on May 8th.

On Saturday Mr. Courtney went off on the early service on the D.H.4a to Paris in the rain and returned at midday. Shortly after Mr. Barnard and Mr. Baxter went to Brussels in the same machine in connection with their terminal there.

Mr. Baxter was originally with Beardmores and has been with the I.A.L. about a month in charge of engines, in which department he has speedily made his presence felt.

The Daimler Airway have been running a regular service with the one machine at present delivered, going to Paris in the morning and returning to Croydon in the evening, each of the pilots making the trip in turn.

Mr. Muir has had his Avro out during the week carrying numerous joyriders, and his other machines are being prepared for the coming season. The Surrey Flying Services have also been at work repairing those of the Royal Aero Club machines which were damaged in the races. The B.E.2e on which Admiral Mark Kerr sat with such aplomb has been deleted.

Mr. C. D. Barnard came over from Stag Lane on a D.H.9c Thursday to pick up three passengers with whom he left for Paris on a special trip.

The same day Mr. Van der Hoop, a Dutch pilot, did a test flight on a Fokker. The Royal Dutch Air Service (K.L.M.) began their Amsterdam-London service on Tuesday and run from Croydon at 10.00 hrs. and Amsterdam at 14.00 hrs. as last year. The service will be augmented on May 18th by a service leaving Amsterdam at 10.00 hrs. and leaving Croydon at 14.00 hrs.

A gold cigarette case has been presented to Major Greer by all connected with the aerodrome on vacating his post as C.A.T.O. The subscriptions were collected by Mr. Coleman, who is now established as honorary M.C. of the aerodrome.

The supply of commercial aeroplanes, even small ones, is not equal to the demand at the moment, and it is therefore the more amazing to see that some of the firms which are more or less in abeyance at the moment or in the hands of receivers but which have a number of multi-seater machines on their hands make no efforts to let prospective buyers know of their existence. If they had taken the trouble they had a good chance of selling these machines last week, and it seems possible that the chance, even if it does not now exist, may again arise shortly.

Lloyd's have for some time had an office on the aerodrome presided over by Capt. Gillman.—G.D.

### Bedworth.

Mr. Fred Holmes of the Berkshire Aviation Tour has just begun his summer campaign at Bedworth. He has now been joined by Mr. Cox, a late officer of the R.A.F.

Two Avros are now in operation, Mr. Cox flying the one and Mr. Brian Ferrand the other. Three hundred passengers have been carried so far, and several cross-country flights have been made to places such as Redditch, Rugby, etc.

During the weekend Mr. Ferrand took up 150 passengers at Lutterworth, and Mr. Cox took 125 at Bedworth.

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 "Propellers," Leeds. Roundhay 601 (5 lines) ..... Front Cover  
 Boulton & Paul Ltd., Norwich. "Boulton," Norwich.  
 Norwich 851 ..... 303  
 Bristol Aeroplane Co., Ltd., The, Filton House, Bristol. "Avia-  
 tion," Filton. Bristol 3906 ..... Back Cover  
 De Havilland Aircraft Co., Ltd., The, Stag Lane Aerodrome,  
 Edgware. "Havilland," Edgware. Kingsbury 160-1, (2 lines) 305  
 Roe, A. V., & Co., Ltd., Newton Heath, Manchester. "Triplane,"  
 Manchester. E5359-1, Manchester ..... Inside Front Cover  
 Vickers, Ltd., Vickers House, Broadway, London, S.W.1  
 "Vickers," Vic., London. Victoria 6900 ..... 298

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 Avenue 3616-7-8 ..... 306

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 "Vandiana," Cent, London. City 3175 ..... 308

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 tion," Filton. Bristol 3906 ..... Back Cover  
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 W.1. "Nitriker," London. Gerrard 8226 (4 lines) ..... 297  
 Rolls-Royce, Ltd., 15, Conduit Street, London, W.1. "Rollhead,"  
 Piccy, London. Mayfair 6040 (4 lines) ..... 301

## FLOTATION AIR BAGS.

R.F.D. Company, 21, Queen's Road, Hersham, Surrey  
 Esher 365 ..... 308

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Brown Bros., Ltd., Great Eastern Street, London, E.C.2. "Im-  
 browned," Eitheddon, London. Bishopsgate 2100 ..... 3  
 Rubery, Owen & Co., Darlaston, South Staffs. "Rooks," Dar-  
 laston. Darlaston 87 (3 lines) ..... 305

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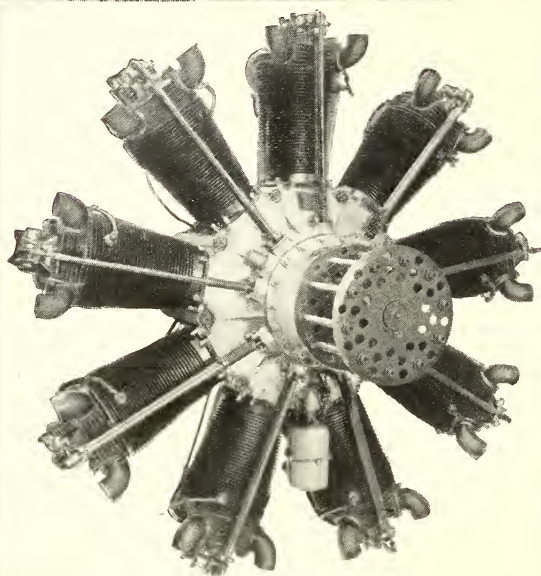


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## The Work of the Air Stations.

The farthest West station is that at Jericho Beach, near the city of Vancouver, B.C. This station is equipped with four twin-engined flying boats. The work has included weekly inspections over the Provincial Government's forests and the Dominion forest belt. Personnel of the Geodetic Survey Branch have been transported to otherwise inaccessible regions. Inspection trips have been made for the Fisheries Branch and a considerable amount of aerial photography has been done for the different departments.

One of the most important duties of this station has been the stopping of opium smuggling, of which there is naturally a great deal since British Columbia has been so foolish as to go dry. The method of the smugglers was to bring opium in ships from the Western side of the Pacific and drop it overboard to confederates in small boats when approaching harbour. The Jericho Beach people took to meeting every ship from the West and watching whether any small boats approached it. Any that were observed to do so were then kept in sight until their position could be signalled to the Customs patrol boats, which then arrested them. In this way quite a number of arrests have been made and this type of smuggling has been practically stopped. Consequently the unfortunate inhabitants of what is supposed to be a free country have been effectively deprived of both drink and dope.

On the other side of the Rockies probably the farthest West station is High River, Alberta, which is equipped with five D.H.4 biplanes. This station has been chiefly employed in doing forest patrols over Clearwater and Bow River Reserves and over Jasper Park. Reconnaissance and exploration flights were made and most interesting photographs of inaccessible regions were secured for the Park Superintendent, who expressed great satisfaction with the information obtained.

The next station is Victoria Beach, Manitoba, which is equipped with three twin-engined flying boats. Here again the work is chiefly forest patrol. Very valuable work has been done in locating and fighting forest fires and in transporting survey parties to inaccessible regions. The boats have also been employed in taking district inspectors, fire rangers and other Government officers on inspection trips which would occupy too much time if undertaken by canoe.

In North Ontario is a mobile unit equipped with three flying boats. This unit is apparently used by Government officials wherever they need special reconnaissances done over forest land North of the trans-Continental railway. During the Summer several large areas have been marked out for Government supervision in future. It is of particular interest to note that after certain timber cruises had been made by air the same area was visited on foot in order to check up the details secured from the air. In every case it was found that the type of timber sketched in from the air was correct and that therefore the aerial timber cruises are of extreme value. Fire protection is not the primary purpose of this Unit, but during the months of August and September numerous forest fires were reported by it and on occasion fire rangers have been flown to the spot.

At the Ottawa Station, which has a varied equipment of a D.H.4, a D.H.4b, an Avro seaplane and an H.S.2L flying boat, the work has been largely experimental. It was here that occurred a somewhat humorous incident when an officer of the Entomological Branch of the Department of Agriculture was taken to see whether he could identify from the air forest areas infected with a particular form of parasite. To the joy of the official in question he found it was perfectly easy to identify the afflicted trees, and such was his excitement at discovering his pet bug from the air that he nearly fell overboard in the endeavour to impart the information to his pilot. At this station excellent results have been obtained with Professor Cook's gyroscopically controlled camera. A large amount of photographic survey work has been done including a photographic survey of the St. Lawrence River and Canal system. The Welland Canal has also been surveyed, as has the Gattineau Valley.

## ON CANADIAN ENTERPRISE—II.

Roberval, Province of Quebec, has three flying boats and has been chiefly engaged on fire patrols and timber sketching. Some idea of the conditions under which this work is done may be gathered from a note in the official report intimating that operations were seriously handicapped at certain periods by the prevalence of smoke, which made flying impossible for days at a time during August and September. Plans for the present year include voyages of exploration much farther into the interior. With this object in view petrol has been carried up country and cached at distant points.

Dartmouth, Nova Scotia, which has a couple of flying boats, is an erection and repair base only. It is in fact the old Halifax Naval Air Station. During the past year the station has been re-conditioned and made more or less fit for human habitation with new paint, proper water supply and so forth. During August of last year a small detachment of the Canadian Air Force using this station as a base co-operated with Naval and Military forces in combined manoeuvres.

### Exceptional Operations.

That accounts for the usual work of the regular Air Stations. But in addition various special operations of interest have also taken place. For example, early in August a demonstration flight of 1,000 miles was made from Victoria Beach. This included a complete circuit of Lake Winnipeg, Lake Winnipegosis, part of Lake Manitoba, and as far North as Le Pas and Cumberland House. Colonel Stevenson, District Forest Inspector for Manitoba, accompanied the machine throughout the entire trip. The object of the flight was to enable a special investigation to be made of the possibilities for instituting aerial forest patrols over the whole forest area in Northern Manitoba. In the course of the flight various district fire-rangers were taken up and flown over their districts, thus receiving very valuable education.

Dr. Wallace afterwards wrote to the Air Board:—"More than anything I had previously imagined this trip impressed me with the future of the Air Service in Northern territory. I obtained a grasp of the topography and water system in the Saskatchewan River Valley that I had not any clear conception of."

Also in the course of this flight the machine demonstrated a new sphere of usefulness for aircraft, namely the reconnaissance and survey of flooded areas in connection with land reclamation. This demonstration was given in the course of a special flight over the Carrot River Triangle, when Mr. Horsey, Engineer of the Reclamation Service, was given a view of approximately 900,000 acres of swamp land which could not possibly have been surveyed on foot.

### A Big Blaze.

Excellent service was done in August also by the High River, Alberta, Air Station, in directing operations against a forest fire which started in British Columbia and spread into the Crownst Forest Reserve, where it raged for twelve days.

Incidentally the efficiency of the High River Station is worth noting. The patrols during August and September averaged over three hours' duration and covered approximately 300 miles each, and two patrols per day during August were scheduled. Out of the 62 patrols two were missed owing to mechanical trouble and six owing to adverse weather.

Yet another and rather odd use for official aircraft was found when machines from the Vancouver Air Station were used by the Entomological Department to locate and define the position and extent of the mosquito breeding areas along the Lower Fraser River.

### Civil and Military Services.

The precise relations between the aviation personnel who carry out under the Air Board these various operations for the different civil departments of the Government is perhaps a trifle undefined, but one gathers that officers and men alike of the Operations Branch of the Air Board are in fact personnel of the Canadian Air Force. Their position is, one imagines, very much that of the personnel of the Royal Engineers who have been for many years employed in the British

Isles on the Ordnance Survey which has made those wonderful maps on which everybody ultimately depends for accurate knowledge of British Geography.

Apparently the actual appointments in the Operations Branch are made by the Civil Service Commission, but it is understood that no officer is appointed to this Branch without having a satisfactory report on passing through his course of training with the C.A.F. at Camp Borden.

Here again we find Canada in advance of the rest of the Empire, for in no other Dominion, not even in the Mother Country itself, is Air Force personnel employed in doing actual productive work, with perhaps the solitary exception of the Air Mail between Cairo and Baghdad, which after all is very much more for the benefit of the Services in Iraq than for civil use. Canada's success in this direction should be sufficient justification for those of the British Air Ministry who believe that in the absence of ordinary commercial enterprise air mail work should be done by the personnel of the Air Force.

When one comes to think of it the idea is perfectly sound, for pilots must fly in order to keep in training and air mechanics must have machines to keep in order so that they may gain the experience necessary in time of war. One cannot, therefore, see any reason why R.A.F. machines should not fly with mails, say, between London and Dublin, or between Cairo and Calcutta for that matter, instead of merely flying round and round an aerodrome for practice.

#### New Blood.

One very interesting point about the Canadian Air Force is that as regards mechanics passing through Camp Borden for training in 1921 only about 12 per cent. had previous service in the R.A.F. One would have thought that the numerous Canadians who were mechanics in the R.A.F. would have kept in touch with aviation by joining the Canadian Air Force for short or long courses of training. One can only assume that when they left the R.A.F. they were so well trained that they were able to get and hold good jobs in civilian life.

Strictly from the point of view of aerial defence it is of course very much better that the bulk of people in training should be new to the game, as it means that a greater number of more or less trained personnel will be available in time of trouble. It may be assumed, however, that quite a large proportion of the best of the Canadian air mechanics are already in the Operations Branch of the Canadian Air Board. One cannot imagine that anything else can explain the extraordinarily high efficiency of the various sections belonging to this branch, more especially considering that the majority of the machines are "disposables" flying boats, and American at that, with American engines.

#### Permanent Staff.

It appears that at present the instructors, flying and technical, in the Canadian Air Force are not permanent members of the Force. It has been found in the case of the old Militia in this country that there must be a permanent instructional staff of officers and men at every depot. Therefore it will undoubtedly be found that similarly a permanent staff of flying and technical instructors will have to be appointed to secure the highest efficiency in the Canadian Air Force, which is itself a species of militia. Furthermore, these officers and men will probably have to be paid better than the current rate of pay in the C.A.F.

#### The Subsidy Question.

No subsidies are given to any commercial aviation enterprise in Canada. Here again the Canadian Air Board shows that it has more wisdom than we have in this country. But evidently every possible assistance is given to commercial concerns, such as providing them with assistance at official

aerodromes and so forth. And when a commercial firm puts up a reasonable proposition everything in the way of official competition is removed.

For instance, the Operations Branch was considering the running of a regular air line into the basin of the Mackenzie River. A commercial company undertook the work, very foolishly with low-powered Junkers monoplanes, and although they had every assistance, except financial help, from the Air Board they were unable to make a success of the proposition. Which only shows the wisdom of refusing to subsidise uncommercial attempts to run air lines.

So far as one can gather Commercial Aviation practically does not exist in Canada except for a few joy-ride companies equipped with war-time Avros and antiquated American machines. It says a good deal for the skill and judgment of the pilots and mechanics concerned with these ventures that hardly any, if any, fatal accidents have occurred.

#### Aircraft Supplies.

At present there is nothing in the way of an Aircraft Industry in Canada. As already indicated the machines in use are obsolete war machines, and unfortunately a very large number of them are American built so that naturally with all the ability of the personnel, the Air Board cannot show the other Government Departments with which it co-operates how really efficient aircraft can be.

Very properly the policy of the Air Board is not to get anything from outside sources which can be obtained in Canada. One only hopes that until such time as Canada itself can build proper aircraft the Air Board will take the next best step in the right direction and make it a rule not to obtain from outside the Empire anything that can be obtained in the Empire. In that case there should be an opportunity for British aircraft constructors to supply at any rate a moderate number of new machines to Canada in the near future and demonstrate to the Canadian Government and the Canadian Public what can be done with adequate machines.

#### Congratulations.

Taking it all round the Canadian Air Board is to be more than ever congratulated on the progress it has made in the past year. As in this country, it has suffered from shortage of money, but in spite of this it has certainly done magnificent work. In some respects, as one has pointed out, it is ahead even of this country in its ideas as to the proper functions of an Air Department, whether it calls itself a Board or a Ministry.

The best that one can wish all members of the Canadian Air Board is that when they come to publish their report at the end of the financial year 1922-23 it may show progress proportionately as great as that which has been made during 1921.—C. G. G.

#### An Addendum.

[Since the foregoing was written information has been received to the effect that the Air Board as such now ceases to exist and that the work of the Air Board will be done by an Air Department inside the Ministry of Defence. Some people seem to fear that as the Canadian Army preponderates in the Ministry of Defence the work of the Air Department may be confined to controlling the Canadian Air Force and that the highly valuable work done by the Civil Air Service side of the Air Board, such as forestry and fishery patrols, may be stopped in order to develop militant aviation, especially as Air Vice-Marshal Gwatkin and Colonel Biggar now leave the Air Department. One is informed, however, that the Secretary of the Air Board, Mr. J. A. Wilson, who has for some years been the moving spirit in Canadian aviation, goes with his Department and most of the Staff into the Ministry of Defence, and that being so one has full confidence in the success of the Canadian Air Department.—C. G. G.]

### ON AIR LINE ACCIDENTS.

Just as certain accidents had to happen in railway, motor and sea transport before the Authorities took proper steps to ensure the safety of passengers so certain accidents will have to happen in air transport before the Authorities act as they would have done at the start if they had had decision as well as foresight. The railways suffered from collisions owing to defective signal systems, coaches were set on fire owing to lack of provision against sparks from locomotives, trains ran off the track owing to defective design and laying of rails, ships caught fire at sea or ran onto rocks owing to lack of lighting or buoying of danger spots, motor-buses broke or overturned and other accidents occurred owing to lack of proper regulations. On the London-Paris Air Route we have already had one fatal collision owing to the neglect of the Department of Civil Aviation to install proper wireless direction indicators and signalling. And only the other day two of our best-known pilots narrowly escaped collision owing to defective wireless arrangements.

#### A NEAR THING

This particular incident deserves description. A pilot flying

from London to Paris knew that another pilot who was starting from Paris about the same time was in the habit of using exactly the same route and landmarks as he uses himself. Although the weather was clear he was not taking any chances, so when well under way he telephoned to the British wireless stations asking them to get in touch with the other pilot and find out the height at which he was flying so that each of them should fly at a different height. The wireless people got in touch with the second pilot and learned his height, but afterwards for some curious reason the first pilot never received the information for which he had asked.

Whether his wireless went wrong or whether the ground wireless went wrong or whether someone forgot to transmit the information to him one does not know. The fact remains that he did not get the information he wanted. The result was that he and the other pilot passed one another at exactly the same height and at a distance of about 100 yards.

So far as one can gather neither pilot saw the other's machine until they were in the act of passing, so that it was luck rather than judgment which saved a collision. The



reason why they did not see one another is probably to be attributed to the fact that each was flying a machine in which the pilot sits behind the passengers' cabin, and has the whole wing structure in front of him. It is of course possible to see over the top of the upper plane in a slightly upward direction, and also to see between the planes, but the upper plane does undoubtedly blot out a certain amount of sky actually on the level with the pilot's eyes and a little below, and it is quite possible for another machine to be hidden in this blind area.

Personally one is inclined to think that the reason why pilots do not see other machines approaching is largely a question of eye focus. Anybody who is in the habit of frequenting aerodromes knows how difficult it is to pick up a machine approaching. One hears it and locates its position within a certain area and yet one does not actually see it till one has been looking for quite a considerable time. As soon as one's eyes pick up the machine and automatically adjust their focus accordingly the machine stands out quite clearly as the only thing in the sky.

It is much the same thing in watching a machine which is going away. So long as one's eye is kept on the machine it remains quite clear, but if one loses sight of it for an instant it is quite difficult to pick it up again. One believes that in much the same way a pilot sitting some distance behind his wings is apt to have the focus of his eyes adjusted involuntarily at the distance of his wings although he may not actually be looking at the wings. Consequently he may approach quite close to another machine without seeing it. Whether this be so or not the fact remains that proper wireless telephonic communication is absolutely necessary.

#### THE CHANNEL CROSSING.

There is another point also concerning the safety of air passengers which demands attention. It is inevitable that sooner or later an aeroplane full of passengers must descend in the Channel.

Figuratively speaking the line of the air route from Croix-don to Lympe and from Boulogne to Paris is littered with the wrecks of aeroplanes. Putting it more accurately one would not be far out in saying that there is no stretch exceeding five miles in length between the points named in which an aeroplane has not made a forced landing in the last two years. Yet, thanks to the skill and judgment of pilots, during the whole of that time no machine has descended in the 20-mile stretch between Folkestone and Boulogne.

The reason actually is that if an engine is going wrong it generally shows some sign of doing so before the machine has reached the coast from London or Paris, as the case may be, and the pilot in such a case comes down either at Lympe or St. Inglevert before starting across the Channel. But some day a perfectly good engine is going to break something somewhere over the Channel without giving any preliminary warning, just as Mr. Shaw's engine let him down three weeks ago between London and Paris.

If such an event occurred to-day so far as one can gather there is no machine of any nationality on any of the cross-Channel air lines which is properly equipped with life-saving apparatus for the passengers. Some of the pilots wear in-

flatable waistcoats and in some cases similar waistcoats are carried for the use of passengers.

These inflatable waistcoats are quite useful things and are quite reliable so long as they are properly kept and are used intelligently. But if they are badly stored or badly used they are liable to develop leaks and if they are not used intelligently they may become an actual danger. That is to say, if they are inflated while the machine is descending into the water they may float the wearer up into the wreckage when his only possible method of escape would be to let himself sink underneath the wreckage and come up clear of it. And no instructions accompany them.

In one case a machine put out to sea on a foggy day and one thoughtful inmate of the cabin took it into his head to test the life-belts. When he did so he found that only one of them was in working order. So he kept it for himself.

#### A NEEDED IMPROVEMENT.

Therefore one is strongly of the opinion that a simpler and more fool-proof form of life-saver is required. Personally one favours the carrying of a life-saving raft.

The best thing of this kind that one has seen is that made by Mr. W. J. Austin, of Swansea, which is inflated by compressed air bottles in a manner very similar to one type of the inflatable waistcoats to which one has referred. The difference is that in the case of the Austin Raft it is bound to be handled intelligently or not at all.

An Austin Raft is a type big enough to sustain all the passengers and the crew of, say, a D.H.8 or 3, can easily be stored in a cupboard in the fairing behind the passengers' cabin and can be released simply by lifting the lid after the machine has settled on the water. Even if the machine turns on its back it will still probably float with that particular section of the fuselage out of the water, and in any case with an intelligent pilot the machine never should turn over.

Another method which is almost equally simple is to make the whole of the fuselage fairing aft of the passengers' cabin in the form of an unsinkable boat. One recalls that a year or so before the War Lieut. Spenser Grey, R.N.A.S. (now Lieut.-Colonel and D.S.O.), actually had a little boat made which took the place of the fairing behind the pilot's seat on a Short seaplane, his idea being that a seaplane could then anchor off shore and that the pilot and passenger could come ashore in the boat. He demonstrated the practicability of the idea with success, but it was never developed.

It might now be worth while to revive the idea for the cross-Channel aeroplanes. It is probable, however, that this method would be a good deal heavier than carrying an Austin Float in the cupboard in the fairing.

In any case some form of safety apparatus in case of descent in the water must be made compulsory in the cross-Channel machines. The longer we go on without a machine falling into the sea the nearer we are getting to the time when a machine must fall into the sea. By all the laws of statistics a passenger crossing the Channel to-day in a machine without life-saving apparatus on board or with such as is available to-day is taking a very much greater risk than a passenger who flew the Channel on a similarly unprovided machine two years ago.—C. G. G.

### THE RE-PRODUCTION OF GERMAN AIRCRAFT.

On May 5th, the German Aircraft Industry will be given by the Allies a certain limited freedom to begin again the manufacture of aircraft. It would appear that following the absurd policy instituted by the Commission Aéronautique Interalliée, German aircraft makers are forbidden to manufacture aircraft-of-war of any kind. They may not make passenger-carrying aircraft capable of rising above a certain altitude and they are not allowed to build single-seaters of more than 60 horse-power.

These regulations are those attributed by rumour, and so far one has not been able to obtain from the Air Ministry or elsewhere any authentic account of the regulations. It is hoped, however, that these will be supplied before long from Germany, and one then hopes to deal with them more fully. In the meantime one need only say that by restricting the production of German aeroplanes the Allies are holding back the progress of aviation, in that the best thing that could possibly happen for British and French constructors would be the production during the next few months of a number of German aeroplanes better than those at present produced in England and France.

Ultimately the restrictions imposed on the German Aircraft Industry will result in German constructors producing single-seaters of 60 h.p. with the performance of British and French machines of 300 h.p. or thereabouts, and the restrictions imposed on passenger-carrying machines will likewise result in the Germans becoming more and more efficient. This also must ultimately react to the advantage of aviation in general, for British and French constructors will be compelled to improve the efficiency of their aeroplanes instead of merely cranking on more horse-power, as they have been doing in the

past. Meantime, one wishes success to the revived German Aircraft Industry, whom one still regards, despite Germany's Commercial Treaty with the Bolsheviks, as our future ally and our first line of defence against the Yellow Races, whether mongrel Slav, Russian, Chinese or Japanese.—C. G. G.

#### A CIRCUMNAVIGATION PROJECT.

During the past week the daily news sheets have had much to say concerning a projected flight round the world by Capt. Norman MacMillan and Major Wilfred Blake. Various firms have been mentioned as providing engines, the aeroplane and other equipment for the attempt, but one is in a position to say that none of the firms whose names are included in these rumours have decided to support the flight, and so far one has not come across any which are even inclined to view the proposition favourably.

If one were asked to choose a pilot for such a flight one could not do better than select Capt. MacMillan, who is not only one of the most skilful pilots yet produced in this country, but also a singularly careful and methodical person in matters of organisation. Unfortunately Capt. MacMillan went to Spain last week, so it has not been possible to get from him any confirmation or denial of the various stories which have become current concerning the flight. One has no knowledge of Major Blake's ability to pilot an aeroplane or to act as navigator on such a flight, but one has no doubt as to his nerve.—C. G. G.

#### GENERAL SYKES' NEW WORK.

It has been stated that Major-General Sir Frederick Sykes, G.B.E., K.C.B., C.M.G., has been appointed a Director of the Underground Railways. One wishes him more success in his subterranean efforts than that which attended his superterranean work.



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de la cola, son de tipo normal y  
fabricados para adaptarse a di-  
ferentes tipos de alas, chassis y  
motores de otros aparatos de series  
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## THE WEEKLY COMMENTARY.

The work done by the Bristol Aeroplane Company in developing their very successful air-cooled radial engines is described in this issue.

For obvious reasons it is not possible in the space available to describe this work in any detail, but it is believed that the information given will suffice to indicate the very great amount of careful investigation which was necessary to attain the results already achieved.

The statement as to the special difficulties which are encountered in the design of radial air-cooled engines applies to all engines of this type, and therefore has an

interest quite apart from the exceptional merits of the particular engines to which the article refers.

The result of the Air Ministry Competition for crash-proof tanks is announced in this issue. A technical report on the trials is to be issued and will, it is hoped, be discussed in next week's "Aeronautical Engineering."

The account of Mr. Sidney Cotton's work in Newfoundland during the past Winter, which will be found on page 320, is of great interest as showing the possibility of operating aircraft successfully under Arctic conditions.

## THE BRISTOL AIR-COOLED RADIAL ENGINES.

The extremely fine results achieved during the past few months by the Bristol "Jupiter" and "Lucifer" air-cooled engines—particularly their successful passing of the Air Ministry official type tests—mark a very important stage in the history of the development of the aero engine. It is not generally realised how considerable an advance this particular achievement represents.

The following statement, based mainly on a paper by Mr. Roy Fedden, the designer of the Bristol engines, will give a fairly clear insight into the advantages of the air-cooled radial, and into the difficulties which have had to be overcome in achieving the present development of that type.

The air-cooled radial engine is by no means a novelty. In the very early history of flying the French Anzani and R.E.P. engines were used in considerable numbers and performed much useful work. They were however displaced by the rotaries which, although they were of low efficiency and of high fuel and oil consumption, were of much less weight per h.p. than the radial types. Before the end of the war the rotary type had reached the practical limit of power, and a demand arose for an engine having the good qualities of the rotary—light-weight, compactness and manoeuvrability—but of greater output and of reasonably low fuel and oil consumption.

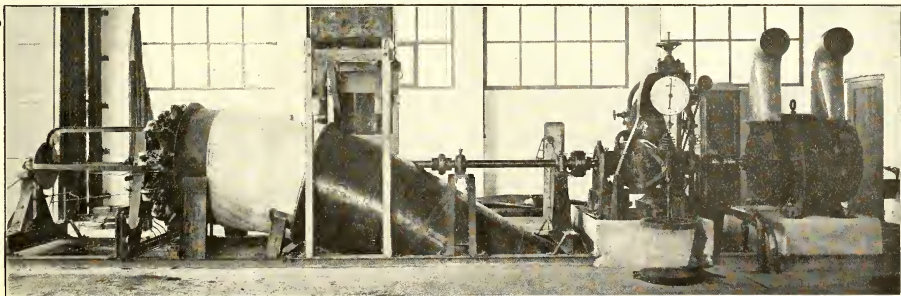
The stationary radial air-cooled engine seemed to be the only type which could meet this need, and a very great deal of time and ingenuity was devoted to engines of this type, of a power between 300 and 400 h.p., during the last years of the war. Unfortunately these engines failed to approach the water-cooled type in reliability, and their lack of this

essential quality put them completely out of court even for military purposes. It is worth while considering shortly what are the advantages of the type, and what are the difficulties which have to be overcome.

In the first place—since in a radial one crank can serve nine or more cylinders—there is a great saving in the weight of the engine, both in regard to crank-shaft and to crankcase. How important a factor weight of engine is may be realised when one remembers that the total weight of the engine and installation in a modern machine is usually not far from that of the total commercial load carried by the machine.

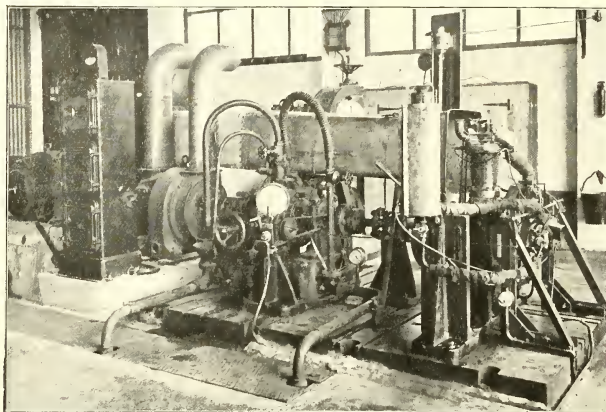
The air-cooled type dispenses with the use of water cooling systems with their attendant troubles. It has to be remembered that under certain conditions water is difficult to obtain, also for some purposes it is necessary to be in a position to take off within a few seconds of starting the engine. With water cooling it is unsafe to attempt this till the water temperature has been raised to near the normal working temperature—which may mean a quarter of an hour's delay. The air-cooled engine can be opened out practically at once.

If the mean temperature of the radiator of a water-cooled engine exceeds 80 deg. C. evaporation losses become very serious. In hot climates where the air temperatures may rise to 45 deg. C. the temperature difference available for cooling falls to 35 deg. C. which calls for very large and heavy radiators. The air-cooled cylinder will develop full power if the fin temperature does not exceed 175 deg. C., and a high air temperature reduces the cooling range available to a much less degree than in the use of the water-cooled type.

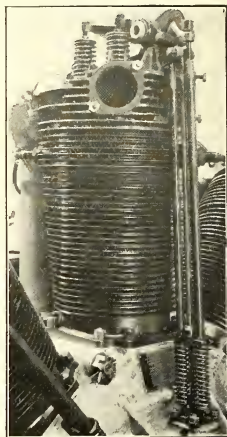


The Test Bench for "Jupiter" and "Lucifer" engines at the Bristol Co.'s Engine Works at Filton.





The Bristol Company's Single Cylinder Test Bed.



The Tappet Clearance Compensating Gear on a "Jupiter" cylinder.

For this reason air-cooled engines are more suitable for tropical conditions than are water-cooled types.

In a single crank radial there is no inertia torque due to the alternate acceleration and deceleration of pistons and connecting rods to be transmitted along the crankshaft—for all the connecting rods connect to the common crank, and the forces balance out on the crank. In multi-throw crank shafts inertia forces are transmitted along the shaft, giving rise to torsional vibrations, which may lead to momentary values of torque far in excess of the mean torque of the engine. This has been the cause of many troubles with reduction gears on aero engines. Because these torsional vibrations are absent in the radial, the problem of a satisfactory reduction gear between engine and airscrew is greatly simplified.

The radial type is simple and relatively cheap to manufacture. A great majority of the parts are simple turned pieces, there are no large and complicated castings, and there are large numbers of identical parts. The type can be dismantled, overhauled and reassembled much more quickly than the "in-line" or vee type, and it is simple and easy to mount and install.

The radial air-cooled engine, however, presents a certain number of difficulties in design, peculiar to the type, and these difficulties have been the cause of the previous disappointments with such engines.

The air-cooling of large cylinders presents certain difficulties, and sufficient attention has not in the past been given to these. The cylinder head in particular needs to be adequately cooled. Very numerous tests and experiments have been necessary to achieve the satisfactory results obtained in the Bristol engines. It has been found advisable to sacrifice accepted theories as to the test gas speeds, valve diameters, etc., in order to obtain an air flow over the head which will avoid localised hot spots, and to avoid too narrow a bridge of metal between valves.

The best compromise so far found has been a closed end steel cylinder, with an aluminium head attached thereto. The attached head contains the valve parts, etc. The horris are made from 40 ton steel, and have integral triangular fins of 0.3 in. pitch. The heads are copper aluminium alloy castings, well annealed before machining to prevent growth and distortion.

The big end bearing of a radial engine of large power requires very careful design. Recollecting that the whole of the pistons and connecting rods are connected to the one crank pin, it can easily be seen that this bearing must carry loads much greater than in a case where an equal power is distributed over a number of cranks. In general, the more important load on a radial big end is that due to inertia of the reciprocating and rotating parts, a load which increases very rapidly with increase in speed of rotation.

Particularly necessary is the provision of an ample bearing surface on the crank pin, and it is essential that both the crank pin and the master big end shall be rigid. If either flexes under load the full bearing surface is not available, and in the case of the big end cracking of the white metal is pretty certain to occur. One may not increase the length of crank pin unduly, or it is impossible to keep it rigid, nor may one build a very massive big end—for its weight will add to the loads imposed on the bearing.

Great care is necessary to give adequate lubrication of this

bearing, and it is vitally important to provide sufficient oil pressure to maintain an unbroken oil film and to pass sufficient oil through the bearing to dissipate the heat generated.

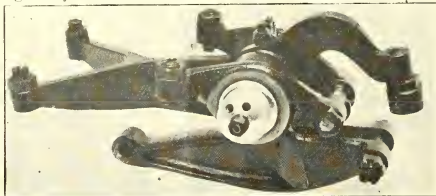
The valve mechanism of radial engines has always been a source of trouble. Probably for cylinders above 6-in. bore it may be desirable to fit individual level drives to an overhead camshaft for each cylinder, but for present sizes the push-rod mechanism is the most satisfactory. Reciprocating weights in the mechanism must be kept down to a minimum, excessive valve clearances must be avoided, and the accelerations and decelerations of the cams must be carefully watched. Inaccuracies in the shape of the cams may lead to very high stresses on the valve gear, and very accurate former grinding is needed for the cam sleeves.

Excessive valve clearances are direct causes of broken valve springs and of valves breaking off under the heads. With the ordinary type of mechanism having a valve rocker fulcrum on the cylinder head, as the cylinder heats up and expands, the fulcrum moves away from the push-rods, giving an increase of clearance. With a  $7\frac{1}{2}$ -in. stroke cylinder this clearance may be as much as 60 or 70 thousandths. It has therefore been necessary to develop an automatic method of taking up this clearance.

Uneven distribution of mixture between cylinders has always given trouble with multi-cylinder engines. The problem is if anything more difficult in the radial engine than on an "in-line" type, but has never been given proper attention. The results have been poor volumetric efficiency, high fuel consumption and burnt-out exhaust valves.

Pistons for high-powered radials represent a difficulty. Minimum weight is essential, for increased piston weight increases the inertia load on big end bearings to an enormous extent. For the Bristol "Jupiter" an addition of 1 oz. to the weight of a piston at normal r.p.m. adds 78 lbs. to the mean load on the big end. At the same time it is necessary to give ample section of metal to conduct the heat from the head to the cylinder walls, and the disposal of the metal to the best advantage can only be arrived at after considerable experiment.

When in 1920 the Bristol Company took over all the designs and patents in connection with the air-cooled engines designed by Mr. Fedden for the Cosmos Company, many of the

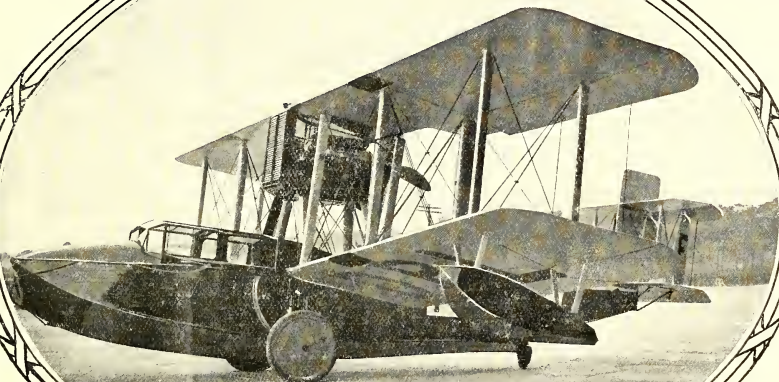


The Rocker-arm Mechanism of the "Jupiter" engine removed from the cylinder head.



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VICKERS "VIKING" AMPHIBIAN

### Aeroplanes for Commercial and Military Use.

The Vickers "Viking" was classified FIRST in the following competitions at the INTERNATIONAL SEAPLANE COMPETITIONS at ANTWERP, July 1920.

1. Shortest time in "unsticking" from water.
2. Fastest time over a given circuit.
3. Climb to 1,000 metres.
4. Altitude with full load



#### Depots

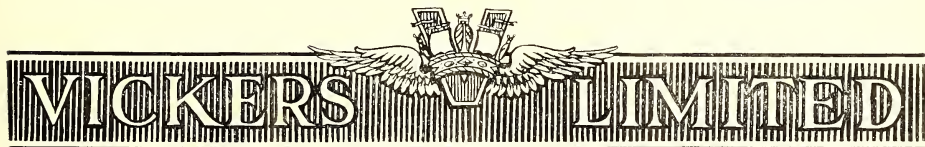
MANCHESTER: Millgate Buildings,  
Long Millgate.  
BIRMINGHAM: Vickers House,  
Loveday Street.  
NEWCASTLE: Commercial Union  
Buildings, Pilgrim Street.  
GLASGOW: Vickers House, 247,  
West George Street.  
BRISTOL: 55, Park Street.  
BELFAST: 26A, Arthur Street.  
LEEDS: Greek Street Chambers,  
Park Row.

### Flying Boats for Commercial and Naval Use.

#### Brief Specification : Viking Mark IV

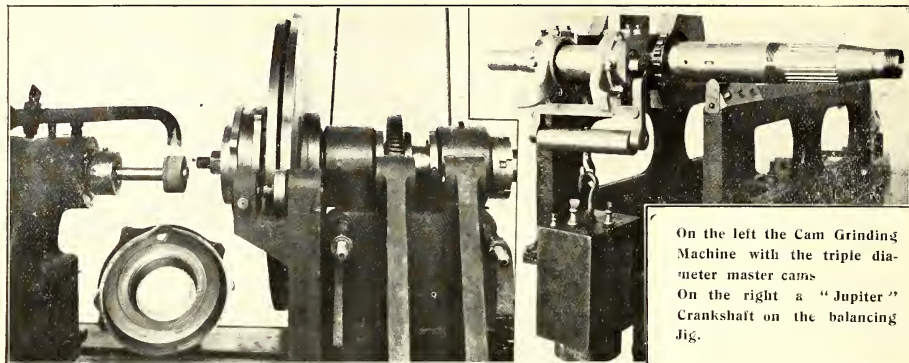
6 Passengers and  
baggage or 1,360  
lbs. Freight.  
RANGE: 340 miles.  
SPAN: 50' 0"  
HEIGHT: 15' 1"  
LENGTH: 35' 0"

The Vickers "Viking" was the winner of the FIRST prize of £10,000 for the Amphibian Class of Aircraft entered for the BRITISH AIR MINISTRY COMPETITION, September, 1920.



Aviation Department,  
VICKERS HOUSE, BROADWAY, LONDON, S.W.1.

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



On the left the Cam Grinding Machine with the triple diameter master cams  
On the right a "Jupiter" Crankshaft on the balancing jig.

problems of detail design which arise from the above-mentioned difficulties were as yet not completely solved, and it was realised that a considerable amount of experimental work was still to be done, and that adequate testing plant was an essential part of their engine shop equipment.

One of the first tasks in the organisation of the Engine Department was the design and construction of a really satisfactory test plant for dealing with radial air-cooled engines up to 750 h.p. The accompanying illustrations will convey some idea of the main test stand which has been laid down. In its details this plant is among the most complete in the country.

The engine is mounted on a bearer plate, and is spigoted thereto just as in the aeroplane fuselage. This bearer plate is attached to a stand which is mounted on rollers, the torque reaction being taken by spring buffers. The engine is coupled by means of two universal joints, and a carden shaft, to a Heenan and Froude water Dynamometer. The tail shaft of the Dynamometer is coupled through a dog clutch to a 100 h.p. variable speed motor. This motor is used for "running in" and starting the engine.

A 65 in. fan located in a pit outside the test house, and direct driven by a 270 h.p. shunt-wound motor, supplies air at an average velocity of 85 m.p.h. This air flow can be varied at will.

A second figure shows the single cylinder bed which is a replica of the main stand in all details.

The arrangement which has been devised to overcome the variation in valve clearance due to expansion of the cylinders is shown in two photographs. One shows the complete assembly on the cylinders, and a second shows the actual rocker mechanism. Instead of pivoting the rockers directly to the cylinder head, the rocker fulcrum is carried on a lever which is itself pivoted at one end to an eyebolt in the centre of the head, and is carried at the other end, by a rod attached to the crankcase. This rod can plainly be seen between the two push-rods. As the cylinders expand, the anchor rod remains sensibly of constant length, and the intermediate rocker-arm fulcrum moves down relatively to the head to an extent sufficient to keep the tappet clearance constant.

The lever carrying the rocker fulcrum fits between two

tongues cast on the cylinder head which serve as a guide and maintain the mechanism in correct alignment.

The method adopted for ensuring accurate machining of the cam sleeves is shown in another photograph. The cams are ground on a tool which is based on the principle of the copying lathe. The grinding wheel is fixed, and the arbor carrying the cam sleeves is made to move radially in and out towards the grinder. This movement is governed by a set of master cam plates which rotate with the cam sleeve, and are kept in contact with a fixed roller by strong springs. The essential feature of this particular fixture is that the master plates are made of three times the diameter of the actual cam sleeve, and thus a degree of accuracy in the spacing and forming of the master plates can be obtained very much greater than would be possible if they were of the same size as the cam sleeve.

Another photograph shows a complete crankshaft on the fixture used for balancing. So far as can be discovered there is nothing very noteworthy about the method used for balancing, the main feature of interest in this photograph being the crankshaft itself. It can be seen that it is a very solid and substantial job. Special notice should be taken of the two curious spout-like projections from the crank pin. These are actually oil throwers. It has already been mentioned that ample lubrication of the big end is essential in an engine of this type, and this has led in the past to one serious difficulty. For an amply lubricated big-end has always meant a large quantity of oil thrown into the cylinders, with the result that the oil consumption of radials has been high, and they have tended to foul their plugs badly.

These spouts which collect practically all the oil from the big ends of the "Jupiter" discharge the said oil into two concentric slots in the crankcase, whence it drains away into the sump. It is thus possible to supply sufficient oil to the big end without the usual consequences hitherto found with type of engine.

There are many other points connected both with the actual processes of manufacture and with the design of these engines, which are worthy of attention, but enough has been said to indicate the very careful and thorough manner in which the Bristol Company have attacked this problem

### THE SAFETY FUEL TANK AWARDS.

The Air Ministry announces that the prizes in the Air Ministry Competition for Safety Fuel Tanks for Aircraft have been awarded as follows:—

FIRST PRIZE, £1,400.—The India-Rubber, Gutta Percha and Telegraph Works Company Ltd., Silvertown, London, E.16.

SECOND PRIZE, £400.—Imber Anti-Fire Tanks Ltd., West Road, Tottenham, London, N.17.

THIRD PRIZE, £200.—Commander F. L. M Boothby (R.N. Retired), "Overway," Tilford, Surrey.

Twenty-six entries were received for the Competition, and eighteen different types of tanks were actually submitted for test.

The Judges consider that the Competition has resulted in the achievement of the objects for which it was instituted and has produced a type of safety fuel tank which, although capable of improvement in several minor respects, is available for immediate employment on Service and Civil aircraft and for a slight increase in weight over that of the standard Service steel tank gives almost complete immunity from fire, either in a crash or in action with enemy machines.

**WORLD TRADE AND WORLD RECOVERY.**  
WORLD TRADE AND WORLD RECOVERY. By "Mercator."  
(London: Eyckigh Nash and Grayson Ltd. Price 4s. 6d. net.)

To every inhabitant of Europe—very particularly of England

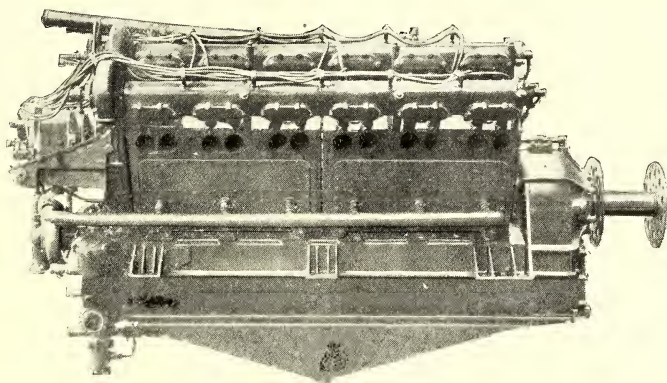
—be he tinker, tailor, or any of the others with the possible exception of the thief, the present disorganised condition of world trade, with its attendant phenomena of high prices, stagnant trade, and unemployment, is a matter of very vital importance.

And it is of the first importance that there should be some sort of an understanding of the economic causes of the present state of affairs and of the kind of political or economical steps calculated to remove the present evils. It is no use for the public generally to leave these matters to the politicians. They generally know less—though they talk more—about matters of real importance than any intelligent human can learn for himself if he will take a little trouble and acquaint himself with facts.

In a little book entitled "World Trade and World Recovery" one who conceals himself under the name of "Mercator" thinks aloud upon present economic conditions. He thinks in very simple language, and, although the complexity of his subject makes it necessary to give to his arguments a very close attention, any ordinary person who will take a little trouble can follow his whole argument.

And if only some reasonable number of intelligent humans will take the trouble to read this book and to think out the problems there studied in the same common-sense manner as that used by "Mercator," it is possible that Europe's recovery from the effects of war may become more rapid.

# SUNBEAM-COATALEN AIRCRAFT ENGINES



## “MATABELE”

400 H.P. 12-CYLINDER  
AERO ENGINE



**THE SUNBEAM MOTOR CAR CO., Ltd.**

LONDON SHOWROOMS:

12, PRINCES STREET, HANOVER SQUARE, W.1.

Export Dept. .. 12, Princes Street, Hanover Square, London, W.1.  
British Sunbeam Motors Agency Inc. .. 25, West 57th Street, New York

HEAD OFFICE AND WORKS: WOLVERHAMPTON.

The following list of Engines, designed and manufactured by the Company, is unequalled in its range. All these engines are of proved efficiency and extreme reliability, and can be recommended with confidence for aviation purposes of all kinds.

“DYAK”	.. ..	100 h.p. 6-cylinder
“ARAB 2” (Direct Drive)	.. ..	200 h.p. 8-cylinder
“MANITOU”	.. ..	300 h.p. 12-cylinder
“MATABELE”	.. ..	400 h.p. 12-cylinder
“SIKH”	.. ..	800/1000 h.p. 12-cylinder
“MAORI”	.. ..	275 h.p. 12-cylinder
“COSSACK”	.. ..	350 h.p. 12-cylinder
“SIKH”	.. ..	400/450 h.p. 6-cylinder



## FLYING IN NEWFOUNDLAND.



THE FIRST AEROPLANE IN LABRADOR—Mr. Cotton's Martinsyde pegged down at Battle Harbour.

Under the name of the Aerial Survey Co., a small band of Englishmen have been doing some extraordinarily good work among the snow, ice, hurricanes, blizzards and so forth of Newfoundland and Labrador. Under the command of Capt. F. Sidney Cotton, and with a collection of aircraft consisting of a D.H.9 (Siddeley "Puma"), Martinsyde "A" type (Rolls-Royce "Eagle"), and a Westland "Limousine" (Napier "Lion"), it has been demonstrated that aeroplanes can with a little organisation do all that other means of transport can do, and considerably more, particularly where the more antiquated means of communication is subject to the idiosyncrasies of the notorious weather common to Newfoundland.

During November the weather was of the worst, and the temperature ranged anywhere from 44 degrees to 10 degrees below zero, with the lower temperatures predominating. During this time the difficulties of landing in snow were overcome by using a special type of ski undercarriage; and by using a special mixture in the radiator the low temperatures were defeated. During the later winter the temperature went to about 20 degrees below zero, and as low as 50 degrees below in some parts.

Nevertheless, a contract was signed with the Postal Authorities to carry mails to Halifax from St. John's with the Martinsyde seaplane. Unfortunately the bay froze weeks earlier than it should have done. It was then decided to fit skids and use the D.H.9 as soon as the ice got strong enough to bear the weight.

What may be termed the inaugural flight of the season was, therefore, begun on December 6th, when the D.H.9 left for Halifax, but there was very little ice across country at that time to make forced landings. A howling blizzard was met when crossing the most mountainous part of the route, and at the same time the engine developed signs of trouble.

By the time the 9 had got through the clouds the engine was cutting-out altogether, so that a reconnaissance was made for a piece of ice large enough on which to land.

A landing was made on the frozen end of Deer Lake, along the beach, the machine crossing a ditch four feet wide and three feet deep and running over some logs without anything being noticed! On attending to the engine it was found that the joints of the cylinders had carried away and were letting water over the magnetos, etc.

It was then decided to fit the skids to the Martinsyde, but the undercarriage showed weak knees from the start, and in a test flight it collapsed completely. As the only spare undercarriage belonged to the D.H.9, this was modified to suit.

It was then agreed by the Post Office that the flight should be postponed until the Spring, and the mail was therefore consigned to the antiquated methods of rail and water transportation and delivered in due course with disheartening punctuality.

The jobs on hand at the time were various mail contracts throughout the Island, mail to Labrador and the seal fishery patrol. As always happens, but is never anticipated, all communications became demoralised by heavy snowstorms and blizzards. Trains were making about 20 yards a day and shipping was entirely held up.

A few demonstration flights were carried out to isolated points, giving them newspapers gratis, but no mails. Business men and politicians were taken to spots in a few hours which they would have reached three weeks later with luck by rail. And then the Post Office asked Mr. Cotton's concern to carry mails, which, after certain persuasion, they did.

Mr. Alan Butler, known in this country as the private owner of a Bristol "Tourer," and a Director of the De Havilland Aircraft Co. Ltd., tuned up the Westland, assisted by Capt. Bennett, and proceeded to deliver mails to about fifteen points on the north of the Island. These mails were delivered to all points within four hours, a trip that normally takes four or five days with a small army of couriers, provided the weather is fair.

Capt. Cotton, with Mr. Stannard, his mechanic, and Mr.



The Martinsyde and the D.H.9 outside the shed at Botwood, Newfoundland. The 9's engine is running producing the blizzard in background. The wheels under the Martinsyde float were borrowed from a fire escape

# Over 1,000 Hours . . . .

"AFTER over a thousand hours' flying behind a Siddeley 'Puma' engine, I have never experienced serious trouble from the engine itself and only on rare occasions have its accessories required adjustment or repair.

"Throughout my European Tour on a D.H.9C, the continual efficient service given by the 'Puma' engine has been remarkable, and its simplicity, accessibility and reliability have been the subject of much favourable comment in every country I have visited, where also the fact that I travelled unaccompanied by a skilled mechanic created considerable astonishment. This is a striking testimony to its excellence as a one man engine."

ALAN J. COBHAM.



## ARMSTRONG SIDDELEY Aircraft Engines

### "Puma" Cylinders.

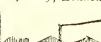
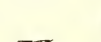
An improved type of "Puma" Cylinder has been designed which ensures longer life to the engine.

Early deliveries can be given and full particulars will be sent on application.

Latest Models: 45 h.p. 2 cyl. Aircooled.  
150 h.p. 7 cyl. Radial. 300 h.p. 14 cyl. Radial.



ARMSTRONG SIDDELEY MOTORS LIMITED  
(Allied with Sir W. G. Armstrong Whitworth & Co., Limited),  
HEAD OFFICE & WORKS: COVENTRY.  
Telephone: Coventry 934. Telegrams: "Sidarm, Coventry."  
LONDON: 10, OLD BOND ST., W.1.  
Telephone: Gerrard 6177. Tele: "Armstideo, Piccy, London."



## GEORGE PARNALL & CO

PROPRIETOR: GEORGE G. PARNALL.

AIRCRAFT DESIGNERS & CONSTRUCTORS.

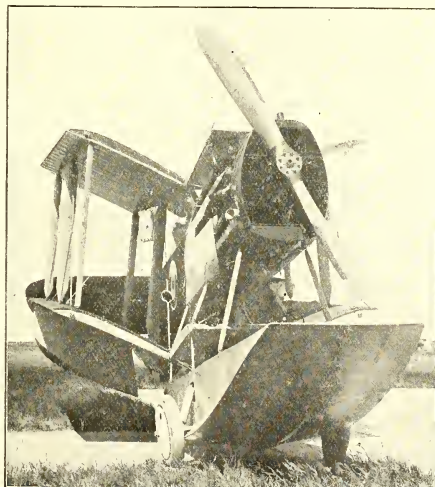
Telegrams: "WARPLANES" BRISTOL

Telephone: No. 4775 (2 LINES)

DESIGNERS & MANUFACTURERS OF  
ALL TYPES OF MODERN AIRCRAFT  
SPARE PARTS SUPPLIED

COLISEUM WORKS  
PARK ROW  
BRISTOL

FACTORIES: PARK ROW, BRISTOL  
FEEDER ROAD, BRISTOL



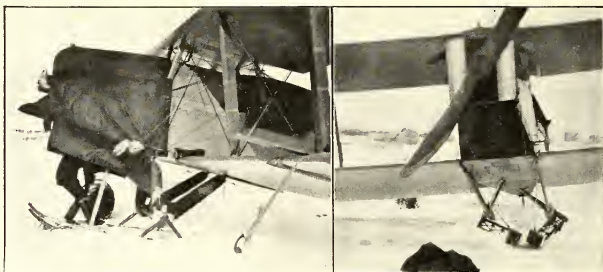
Front View of the  
Parnall "Puffin," a  
Folding-wing Amphibian  
Aeroplane  
(Napier Engine).

This is shown as  
an example of the  
class of work done  
by George Parnall and  
Co., and supplied to  
the British and Allied  
Governments.

Any class of aero-  
plane for any purpose  
can be designed and  
built by the firm.

The photograph on the right shows the Martinsyde undercarriage during its attack of weak knees.

The photograph on the left shows a spare D.H.9 undercarriage adapted to replace the original, with the skis in place.



Hart, a local woodsman, proceeded to investigate the mysterious hinterland of Labrador. From Botwood, their H.Q., they flew to St. Anthony, the northern port of Newfoundland, 150 miles N. of Botwood. From there they pushed off to Battle Harbour, a wireless station in Labrador.

The wireless operator in charge there first heard the magnetos of the Rolls "Eagle" when the Martinsyde was twenty miles away, and the noise getting louder in his receivers, he rushed out into the snow and prepared himself for the end of all things. His astonishment was only equalled by the dumbstruck wonder in the faces of the other inhabitants when the "Tinsyde" landed.

A stay of a few days was made at Battle Harbour, and a course was made for Cartwright, a Hudson Bay Co. post, 210 miles N. of Anthony. The people there are cut off from the world from November to June, so the arrival of the aeroplane with mails and newspapers less than a week old has probably done more to demonstrate the utility of aircraft in that part of the world than anything else could have done.

A blizzard was weathered there. But with the machine tied down and covered up, with catalytic lamps under the cowl and antifreezing mixture in the radiator, it suffered no damage.

Cartwright was left on March 12th, and St. John's, a distance of 600 miles, was reached in 7 hours, with mails and furs on board. The normal route from Cartwright is by courier down the N. side of the St. Lawrence River to Quebec and by boat and rail back to St. John's, a journey that takes 80 days.

On the return to Botwood both machines were prepared for the sealing jobs, Capt. Bennett and Mr. Butler with a wireless operator taking the Westland, and Mr. Cotton and Mr. Stannard the Martinsyde over the icefields. The sealing ships were located about 50 miles to the E. of Foggo Island.

After the patrol around the vicinity of the ships the Westland returned to Foggo to stand by while the Martinsyde carried on.

A patch of seals was located in a different direction from the way the ships were steaming so they returned and landed alongside s.s. *Sagona*. Although the sealing owners did not give a definite contract, the Aerial Survey Co. felt that they would eventually be wanted.

To prove that they could observe the seals without difficulty the steamers were put onto one or two small patches quite near that they had missed. The information regarding larger patches was withheld, and the sealing owners were informed that their ships could be filled. Thinking that the ships would find the seals the owners held off as long as possible, but on March 22nd they asked assistance and came to terms.

By this time the ships and seals had moved considerably off the land and it was a much more difficult and hazardous proposition to locate them again.

The owners are now definitely convinced that co-operation with aircraft will ensure good catches for them in future years, and no difficulty is expected in getting yearly contracts for seal spotting.

The Aerial Survey Co. can no doubt claim the honour of being the only company to inaugurate and carry out successfully flying in Arctic America. When the obstacles they have had to contend with and have successfully overcome are taken into consideration, the accomplishment becomes even more meritorious.

The weather conditions alone are sufficient to dishearten the most enthusiastic, but many other little trials have been met and treated as being a part of the day's work. To see a hangar go through the ice in a storm and then be torn to shreds, as happened at St. Anthony early in their venture, must have been galling. And having to work in the open in a temperature of about 20-30 degrees below zero, as the result, apparently had no effect whatever on their determination to see the thing through.

As the result of this year's work, considerable experience has been gained. It is expected that they will have several new machines out there this Fall, and will have the company thoroughly established by next Winter in order to attack the seal spotting and mail carrying work in a thorough manner.—L. B.

### GLIDING IN SWITZERLAND.

The training course in gliding and soaring which was held at Gstaad during March and the competition for Swiss pilots which followed it, passed off without any untoward results. Herr Pelzner, of Nurnberg, a well-known competitor at the Rhon competition, acted as instructor. Four other pilots took part, and six machines were used. The total number of flights was 130, and the total duration was 1,876 seconds. Only three of the six machines were in regular use, the other six not having passed out of the experimental stage.

The longest flight was made by Pelzner, of a duration of 42.2 seconds. The longest flight made by a Swiss pilot was 32 seconds, made by Cuendet upon a cantilever monoplane designed by Herr Loeffli, the well-known Swiss aeroplane designer.

The prize of 500 francs and the challenge cup was gained by M. Chardon, who on a Pelzner biplane made 61 flights of a total of 672 seconds. The second prize (300 francs) was awarded to Cuendet, who made 18 flights of a total of 389 seconds.

It was found that in the snow machines fitted with skids could get off and land with great ease, but gliders of the type wherein the pilot hangs from the machine and uses his legs as an under carriage, landing in the snow was a difficulty, and such machines were apt to suffer on landing.

### THE R.Ae.C. AND GLIDING.

In view of the activity in Gliding Experiments in other countries, it has been suggested that facilities should be offered in this country to those who are interested in these experiments.

The Royal Aero Club, 3, Clifford Street, London, W.1, will be pleased to hear from all those who contemplate taking an active interest in Gliders.

### AIR MINISTRY NOTICE TO GROUND ENGINEERS.

No. 5, 1922.—AVRO 504K TYPE AIRCRAFT: LIFT WIRE FITTINGS.

It is hereby notified:—

1. The attention of Ground Engineers is directed to the necessity of ensuring that the wiring plate and socket (Joint H, item I.F.103) taking the duplicate lift wires at the upper end of the outer rear interplane struts (port and starboard) on Avro 504K aircraft are of standard pattern.

2. The standard fitting is made up of 14 S.W.G. plate, the lower part, which carries the socket and wiring lugs, being reinforced on its upper face by the addition of a plate of similar thickness (item I.F.80), joined by edge welding, but cases have come to notice in which the part of the fitting has consisted of a single plate only.

3. All licensed Avro 504K aircraft should be examined forthwith, and any single plate fittings found should be replaced by standard fittings.

4. No Certificate of Airworthiness will be issued or existing Certificate of Airworthiness renewed in respect of any aircraft of this type unless the standard fittings are incorporated.

Air Ministry, April 25th, 1922.

### A NEW APPOINTMENT.

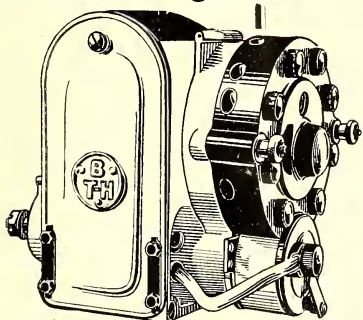
Lieut.-Colonel C. F. Hitchins, D.S.O., M.I.Mee.E., who recently resigned the appointment of General Manager to Agricultural and General Engineers Ltd. has joined Sir W. G. Armstrong-Whitworth and Co. Ltd.

### MORTGAGES, CHARGES & SATISFACTIONS.

BERKSHIRE AVIATION CO. LTD.—Debenture dated April 15th, 1922, to secure £100, charged on the company's property, present and future, including uncalled capital. Holder: A. C. S. Benning, Dunstable, Beds.



## Notable Successes with B.T.H. Magnets



B.T.H. Magneto,  
Type A.V.8.



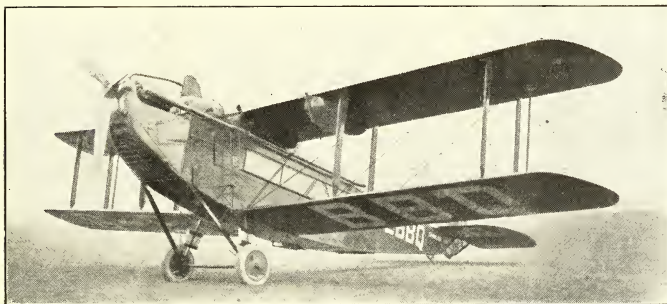
**The British Thomson-Houston Co., Ltd.,**  
Lower Ford Street - - - - - Coventry.

- 1919—British Altitude Record (approximately six miles).  
Fastest time London-Amsterdam (2 hrs. 10 mins.).  
Fastest time London-Paris-London (1 hr. 20 mins.;  
1 hr. 38 mins., both journeys on same day).  
First Place at 145 m.p.h. in 137 metres Closed Circuit  
Race at Amsterdam Aero Exhibition.  
First Non-Stop Flight London-Madrid (by aeroplane).  
First Flight across Atlantic (by Airship R.34).  
Eighteen British Records made in one day, by one  
Pilot on one machine.  
First and Second Places secured in Aerial Derby.
- 1920—World's Record for useful load carried, height and  
duration.  
British Speed Record (166½ miles per hour).  
Secured five out of eight prizes awarded in Air Ministry  
Trials at Martlesham Heath.  
First and Second Places in Aerial Derby.
- 1921—First, Second and Third Places secured in Aerial Derby.  
Also First and Second Handicap Prizes.

**B.T.H. Magnets also helped to create the latest Speed  
Record held by the Gloucestershire Mars**

## The D.H. Type 34

(11 Seater).



As supplied to Daimler Hire Ltd. and The Instone Air Line  
by

**THE DE HAVILLAND AIRCRAFT CO., LTD.,**  
Stag Lane Aerodrome, Edgware, Middlesex.

Telephone—KINGSBURY 160, 161.

Telegrams—"HAVILLAND EDGWARE."

# COMMERCIAL AERONAUTICS.

## AND CIVIL AERIAL TRANSPORT.

### THE UNITED KINGDOM OF GREAT BRITAIN AND IRELAND.

#### CONTINENTAL ARRIVALS AND DEPARTURES.

[The following table of arrivals at and departures from the British Air Ports is compiled on the following system:—First comes the initials of the Air Line; next the type of machine; next the international number of the machine; next the ports of departure and destination; next the times of departure and arrival; next the cargo, whether goods (G) and/or mails (M); next the number of passengers; and finally the name of the pilot and number of mechanics, if any.]

#### The London Terminal Aerodrome, Croydon. (Telephone: Croydon 2720.)

##### APRIL 24th:

I.L., DH4, G-EAMU, London-Paris, 06.48-08.45, G., Nil, Powell.  
M.A., Breguet, F-CMAC, London-Paris, 07.06-09.45, G., Nil, Range.  
K.L., Fokker, H-NABT, London-Adm, 09.59-12.45, G.M., 1, Warrnaar.  
I.L., DH8, G-EAWW, London-Paris, 10.12-12.20, G.M., Nil, Robins.  
H.P., H.P., G-EATH, London-Paris, 12.22-14.53, G.M., 5, McIntosh & I.  
D.A., DH34, G-EBBS, London-Paris, 12.48-14.45, Nil, 1, Robinson.  
K.A., Breguet, F-CMAC, London-Paris, 13.09-14.49, G., Nil, Perignon.  
M.A., Breguet, F-ADBM, Paris-Ldn, 07.20-11.56, 25th, G.M., Nil, Revenue.  
I.L., DH4, G-EAMU, Paris-London, 11.50-15.16, G., Nil, Powell.  
H.P., Breguet, G-EAWW, Paris-London, 12.19-16.59, G., 6, Olley.  
M.A., Spad, F-ADH, Paris-Ldn, 12.31-02.00/24th, G.M., 2, Charpentier.  
K.L., Fokker, H-NABN, R'dam-London, 14.46-18.37, G.M., 1, Sillims.

##### APRIL 25th:

I.L., DH8, G-EAWW, Paris-London, 15.10-18.20, Nil, 5, Robins.  
D.A., DH4, G-EBBS, Paris-London, 15.25-18.30, G., 1, Robinson.  
I.L., DH8, G-EAWW, Paris-London, 06.50-11.15, G., Nil, Holmes.  
M.A., Breguet, F-CMAC, London-Paris, 06.45-08.15, G., Nil, Pelage.  
I.L., DH8, G-EARO, London-Paris, 09.32-12.30, G.M., Nil, Powell.  
H.P., DH4, G-EAWW, London-Paris, 10.32-12.30, G., Nil, Dismore.  
K.L., Fokker, H-NABN, London-Adm, 10.00-12.16, G.M., 1, Sillims.  
D.A., DH34, G-EBBS, London-Paris, 12.47-14.26, G., Nil, Robertson.  
M.A., Spad, F-ACMG, London-Paris, 13.07-15.20, G., 1, Chauloux.  
H.P., Bristol, G-EAWW, London-Paris, 14.35-16.40, G.M., Nil, Carter.  
I.L., Spad, F-ADAF, London-Paris, 08.05-12.10, G.M., Nil, Perignon.  
H.P., H.P., G-EATH, Paris-London, 10.39-14.50, Nil, 10, McIntosh & I.  
I.L., DH8, G-EAWW, Paris-London, 12.20-16.05, G., 5, Gastoux & I.  
H.P., DH8, G-EAWW, Paris-London, 12.28-15.15, G.M., 3, Olley & I.  
I.L., DH8, G-EARO, Paris-London, 13.43-16.45, G., 6, Powell.  
K.L., Fokker, H-NABK, R'dam-Ldn, 14.27-18.20, G.M., 2, Van der Houw.  
K.L., Fokker, H-NABM, A'dam-London, 14.06-19.00, G.M., Nil, Hofstra.  
H.P., DH4, G-EAWW, Paris-London, 15.05-17.36, Nil, 1, Dismore.  
I.L., DH8, G-EAWW, Paris-London, 15.17-18.06, G., 6, Holmes.  
D.A., DH34, G-EBBS, Paris-London, 15.25-18.00, Nil, 1, Robertson.

##### APRIL 26th:

I.L., DH4, G-EAMU, London-Paris, 06.25-08.20, G., Nil, Courtney.  
M.A., Breguet, F-ADBM, London-Paris, 07.49-10.20, G.M., Nil, Revenue.  
K.L., Fokker, H-NABK, Ldn-Adm, 10.00-12.25, G.M., 2, Van der Houw.  
H.P., DH4, G-EAWW, London-Paris, 10.10-12.30, G., 1, Dismore.  
I.L., DH8, G-EAWW, London-Paris, 10.25-13.05, G.M., 1, Jones.  
G.E., Goliath, F-ADDT, London-Paris, 11.59-14.44, Nil, 1, Gastoux & I.  
H.P., H.P., G-EATH, London-Paris, 12.28-15.15, G.M., 3, Olley & I.  
D.A., DH34, G-EBBS, London-Paris, 12.43-14.56, Nil, 1, Robertson.  
I.L., DH4, G-EAMU, Paris-London, 10.40-13.00, G., Nil, Courtney.  
G.E., Goliath, F-GEAO, Paris-London, 12.03-15.21, G., 1, Favreau & I.  
H.P., Bristol, G-EAWW, Paris-London, 12.07-14.28, G., 7, Carter & I.  
M.A., Spad, F-ACMF, Paris-London, 12.30-16.17, G.M., 1, Portal.  
M.A., Spad, F-ADAF, Paris-London, 13.30-16.15, G., Nil, Robyn.  
K.L., Fokker, H-NABT, R'dam-Ldn, 14.06-17.37, G.M., Nil, Pyl.  
H.P., DH4, G-EAWW, Paris-London, 15.02-17.20, Nil, 2, Dismore.  
I.L., DH8, G-EAWW, Paris-London, 15.07-17.44, G., 1, Jones.  
D.A., DH34, G-EBBS, Paris-London, 15.27-17.50, G., Nil, Robinson.

##### APRIL 27th:

I.L., DH4, G-EAMU, London-Paris, 06.31-08.45, G., Nil, Bradley.  
M.A., Spad, F-ADH, Paris-London, 06.45-09.37, G.M., Nil, Briere.  
K.L., Fokker, H-NABT, London-Adm, 10.00-12.25, G.M., Nil, Hofstra.  
H.P., Bristol, G-EAWW, London-Paris, 10.10-12.37, G., 2, Carter & I.  
I.L., DH8, G-EARO, London-Paris, 10.11-12.35, G.M., Nil, Shepperson.  
G.E., Goliath, F-THMY, London-Paris, 12.42-14.25, G.M., Nil, Favreau & I.  
D.A., DH34, G-EBBS, London-Paris, 12.47-14.45, M., 2, Herne & I.  
M.A., Spad, F-ADAF, Paris-London, 13.15-16.20, G., Nil, Perignon.  
M.A., Spad, F-ADAF, London-Paris, 15.05-17.45, G., 2, 1, Lvoyn.  
H.P., DH4, G-EAWW, London-Paris, 17.35-19.23, Nil, 2, Dismore.  
M.A., Breguet, F-CMAC, Paris-London, 07.33-11.26, G.M., Nil, Paillie.  
I.L., DH4, G-EAMU, Paris-London, 10.40-13.05, Nil, Bradley.  
G.E., Goliath, F-ADDT, Paris-Ldn, 12.03-15.21, G.M., Nil, Perignon & I.  
M.A., Goliath, F-ADAF, Paris-London, 13.27-16.53, G.M., 2, Le Men & I.  
K.L., Fokker, H-NABN, A'dam-London, 14.23-17.40, G.M., 1, Geyssendorfer.  
H.P., Bristol, G-EAWW, Paris-London, 14.43-17.39, G., 5, Carter & I.

ABBREVIATIONS: A.—A.D.—Aircraft Disposal Co. B.A.—Berkshire Aviation Co. B.C.—British Aeroplane Co. C.A.—Department of Civil Aviation. D.A.—Daimler Airway. D.H.—De Havilland Aircraft Co. G.E.—Compagnie des Grands Express Aeriens. H.P.—Handley Page Transport Ltd. I.L.—Instone Air Line. K.L.—Konink-like Luchtvaart Maatschappij. L.A.—Leatherhead Aviation Services. M.A.—Messageries Aeriennes. M.W.—Marconi Wireless Telegraph Co. Ltd. P.O.—Privately owned. P.L.—Peters Ltd. S.F.—Surrey Flying Services. S.N.—Syndicat National pour l'Etude des Transports Aeriens (S.N.E.T.A.).

I.L., DH8, G-EARO, Paris-London, 14.46-17.33, Nil, 3, Shepperson & I.  
D.A., DH34, G-EBBS, Paris-London, 15.23-17.49, G., 2, Herne.

##### APRIL 28th:

I.L., DH8, G-EAWW, London-Paris, 06.35-09.00, G., Nil, Holmes.  
H.P., Bristol, G-EAWW, London-Paris, 11.28-13.56, G., 3, McIntosh & I.  
I.L., DH4, G-EAMU, London-Paris, 11.31-13.35, M., 2, Robins.  
K.L., Fokker, H-NABT, London-Adm, 11.35-14.26, G.M., Nil, Pyl.  
G.E., Goliath, F-GEAO, London-Paris, 12.44-16.46, G., 4, Labouchere & I.  
M.A., Spad, F-ACMF, London-Paris, 14.12-16.45, G., 1, Portal.  
I.L., DH8, G-EARO, London-Paris, 14.43-17.03, G., 7, Powell.  
H.P., H.P., G-EATH, Paris-London, 12.08-15.23, Nil, 10, Olley & I.  
G.E., Goliath, F-THMY, Paris-London, 12.11-15.27, G., 3, Gastoux & I.  
H.P., DH4, G-EAWW, Paris-London, 12.15-14.38, Nil, 2, Dismore.  
M.A., Goliath, F-CMAC, Paris-London, 12.28-15.23, Nil, 5, McIntosh & I.  
K.L., Fokker, H-NABK, A'dam-London, 14.53-17.46, G.M., 2, Warrnaar.  
I.L., DH8, G-EAWW, Paris-London, 15.10-17.45, Nil, 3, Holmes.  
H.P., Bristol, G-EAWW, Paris-London, 15.25-17.42, G., 7, McIntosh & I.  
I.L., DH4, G-EAMU, Paris-London, 15.50-19.10, Nil, 1, Robins.

##### APRIL 29th:

I.L., DH8, G-EAWW, London-Paris, 06.35-09.06, G., Nil, Bradley.  
M.A., Breguet, F-CMAC, London-Paris, 06.38-09.40, G., Nil, Paillie.  
K.L., Fokker, H-NABN, Ldn-Adm, 09.55-12.30, G.M., Nil, Geyssendorfer.  
G.E., Goliath, F-ADDT, London-Paris, 11.55-15.00, G., 1, Gastoux & I.  
H.P., H.P., G-EATH, London-Paris, 12.28-15.23, Nil, 10, McIntosh & I.  
D.A., DH34, G-EBBS, London-Paris, 12.45-15.05, Nil, 4, Robertson & I.  
M.A., Goliath, F-ADAF, London-Paris, 14.00-17.03, G., Nil, Le Men & I.  
G.E., Goliath, F-CMAC, Paris-London, 12.40-15.49, G., 5, Grasset & I.  
M.A., Goliath, F-THMY, Paris-London, 13.25-16.17, G.M., 2, Coupet.  
I.L., DH8, G-EARO, Paris-London, 14.42-17.10, G., 1, Powell.  
K.L., Fokker, H-NABT, R'dam-Ldn, 14.23-17.40/24th, G.M., 2, Sillims.  
D.A., DH34, G-EBBS, Paris-London, 15.20-17.55, Nil, 5, Robertson & I.  
H.P., Bristol, G-EAWW, Paris-London, 15.45-18.20, G., 6, Olley & I.

##### APRIL 30th:

H.P., DH4, G-EAWW, Paris-London, 10.40-12.45, G., Nil, Dismore.  
I.L., DH4, G-EAMU, London-Paris, 11.00-13.15, G., 1, Jones.  
D.A., DH34, G-EBBS, London-Paris, 11.54-13.15, Nil, Nil, Robinson & I.  
M.A., Goliath, F-ADCA, London-Paris, 12.38-15.03, G., Nil, Le Sec & I.  
M.A., Breguet, F-CMAC, Paris-London, 12.50-15.20, Nil, 1, Charpentier.  
M.A., Breguet, F-CMAC, Paris-London, 07.00-10.30, G., Nil, Range.  
D.A., DH34, G-EBBS, Paris-London, 12.45-17.18, G., 6, Robinson & I.  
I.L., DH8, G-EAWW, Paris-London, 12.50-17.30, G., 4, Bradley.  
H.P., DH4, G-EAWW, Paris-London, 15.10-17.53, Nil, 2, Dismore.

#### Inland Flying at Croydon.

April 24th.—I.L., Vimy to Brooklands (Barnard).  
April 25th.—S.F., Avro, joy-rides (Muir).  
April 26th.—Nil.  
April 27th.—R.A.C., Avro, tests.  
April 28th.—R.A.C., Avro, joy-rides (Charlton and Vincent); S.F., Avro, joy-rides (Muir); I.L., DH34, from Stag Lane (C. D. Barnard).  
April 29th.—S.F., Avro, joy-rides (Muir); D.A., D.H.34 from Stag Lane; I.L., D.H.34, test (Barnard); R.A.C., Avro, joy-rides (Charlton); F.O., Avro, joy-rides (Leavay).  
April 30th.—S.F., Avro joy-rides (Muir); P.O., D.H.6, joy-rides (Yates); H.P., test (Barnard) (Uwins).

#### Flying by the Aircraft Disposal Co.

April 25th.—Avro, G-EBCK, left for Brussels (Foot); D.H.9, test (Stocken); Avro, G-EDCS, test (Stocken).  
April 26th.—Avro and 2 D.H.9s, tests (Stocken).  
April 27th.—Avro, G-EDCS, test (Stocken); D.H.9, test (Stocken); Avro, G-EBU (Stocken).  
April 28th.—Avro, G-EDCS, left for Brussels (Foot); Avro and 2 D.H.9s, tests (Stocken).  
April 29th.—Avro, G-EDCO, left for Brussels (Havys); Avro, G-EDCF, left for Brussels (Foot); 2 D.H.9s, tests (Stocken).

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Probably the great value of the accuracy of the Cinema record has never before been so prominently brought to the knowledge of the public; but from the beginning of 1915 its accuracy has been utilised in the study of the successive developments of

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### Cross-Channel Statistics.

Week ending April 28th:—

Machines, 103; Passengers, 193; Crews, 134; Total Personnel, 327

Corresponding week last year:—

Machines, 52; Passengers, 206; Crews, 66; Total Personnel, 272

Corresponding week, 1920:—

Machines, 44; Passengers, 44; Crews, 46; Total Personnel, 90

### Flying at Croydon.

The outstanding event of the week is the performance of Capt. Herne, of Daimler Airways, Ltd., who took a D.H.34 to Paris and back twice on Monday. This, one believes, establishes a record for commercial machines, and incidentally covering 1,000 miles or so. His total flying time was only eight hours thirty-seven minutes, and his actual flights 2 hours 3 minutes, 2 hours 8 minutes, 2 hours 16 minutes, and 2 hours 10 minutes.

Capt. Herne is to be congratulated on this fine piece of work, although one does not exactly know why he did it. It will be remembered by those who are ancient in Commercial Aviation that several Aircro pilots did the trip to Paris and back, and to Paris again when there was a rush of passengers.

In conversation with one of those "Brass-bound men, who strongly occupy the seat about the Trust House fire," one learns that the new I.A.L. Vickers "Vulcan" is being flown on Monday, and will shortly be delivered to Croydon.

C.M.A. are about to put the clock back an hour, starting their 07.00 newspaper machine at 06.00 in future. It is whispered that Huestons intend to launch a liner as early as 04.00 with the Paris newspapers.

The Duty Office are understood to have asked for a definite ruling as to what constitutes an early morning and what a late evening machine.

The Aerodrome becomes daily more and more like a mediæval "Fayre" with its assortment of old-world parti-colored booths where the stranger would not unreasonably expect to taste a new toffie, or inspect the vital organism of a vacuum carpet sweeper.

The K.L.M. have blossomed forth in the way of flying which flag is the same as that originally used by the early Dutch navigators, who discovered New Amsterdam (frequently spoken of as New York). The city of New York has, one hears, recently adopted these colours as its own (without, of course, the K.L.M. monogram), and Capt. Leverton confidently expects to have some amusing controversies with Americans as to why K.L.M. have "pinched" the ancient emblem of the old-world city.

One understands that a K.L.M. F.I.V.I. machine, fitted with a Rolls-Royce "Eagle" instead of a Siddeley "Puma" will shortly make its appearance on the London-Amsterdam route.

Apocryph the "Brighter Night Club Scheme" one would love to know where the "Puck and Currant Loaf" is, and what its special attraction can be.

A new game, which has almost ousted "L'Attaque" from popular favour, has appeared amongst us. It is called "The Happy Hazard of the Horse and Harrow," and is played with little black and white check flags. Pilots love it. It is an outdoor game.—"X"

### THE PERFORMANCE OF THE O/400.

On various occasions this paper has referred to the O/400 type Handley Page twin-engined biplane as a grave and reverend aircraft which, while inspiring both affection and respect, is not regarded as precisely a speed-machine of any kind. One may state parenthetically that the O/400 is the only aeroplane in which one has personally committed oneself to the air between London and Paris and that one did so because of one's reliance on its ability to land slowly even if it took longer over the journey than some of its competitors. One must confess, therefore, to genuine surprise in finding that when the times of the O/400 Handley Pages on the London-Paris Route are taken on an average they work out surprisingly close to those of their admittedly faster competitors.

Lieut.-Col. Bristow, who is responsible for the mechanical efficiency of the Handley Page Transport machines, recently gave one a table giving the precise times of the thirty voyages from Croydon to Paris and from Paris to Croydon made by O/400s from Jan. 3rd to March 15th inclusive, this being, it will be remembered, a particularly foggy and windy period. The average speed for these voyages works out at 3 hours 02 minutes. Somewhat naturally perhaps the slowest and the fastest voyages were both made on Jan. 3rd, the trip from Croydon to Paris taking 2 hours 12 minutes, and the trip from Paris to Croydon 5 hours 02 minutes, but the majority of the trips take between 2 hours 30 minutes and 3 hours 50 minutes.

As against these, a table of the times taken by what is pro-

bably the fastest machine on the line showed that the average time is 2 hours 35 minutes. Thus there is in fact only 24 minutes difference between the fastest machine on the London-Paris route and the old O/400.

Naturally a large proportion of the credit for this high average speed is due to the Rolls-Royce engines with which the O/400 has always been fitted, and of course much credit is also due to the high efficiency with which the machines are maintained by Ogilvie and Partners as Consulting Engineers. It seems particularly well to put these figures on record in view of the fact that the O/400s are bound to be superseded before long by the new W.8Bs, which are considerably faster.

### WIRELESS QUERIES.

The following letter may be of interest to those concerned with Civil Aviation as at present practised:—

Sir,—  
I should very much like to know if Mr. Powell received his "black silk socks" from Mr. Holmes O.K. which he "Radio-phoned" for this afternoon from the D.H.8 G-EARO. (I don't know what next we shall hear on the 900 metre wavelength).

Also, I should like to say that Croydon often seems to speak too close to the microphone and his speech is very blurred and indistinct, chiefly when he is calling a machine; for when he is speaking quietly to Lympne it is quite good.

April 26, 1922.

(Signed) W. E. PHILLIOTT.

### WIRELESS BONDS.

A Wireless Dinner, inaugurating what it is hoped will become an annual event, was held at the Trocadero Restaurant on Saturday evening the 11th of March, when Admiral of the Fleet Sir Henry Jackson, G.C.B., K.C.V.O., F.R.S., took the Chair. The company, numbering about 150, was composed entirely of those who had served during the Great War as wireless officers of one of the fighting Services or in an equivalent capacity.

Senator Marconi replying to the toast of his health referred in moving terms to his early association with Sir Henry Jackson, (for Captain Jackson as he then was). He also paid a glowing tribute, based on personal inspection over various War fronts, to the efficiency of the British Wireless organisation during the Great War.

The Chairman in complimenting the Organising Committee for the dinner proposed the health of its Chairman, Colonel L. F. Blandy, D.S.O., R.E., Controller of Communications at the Air Ministry.

Colonel Blandy in reply proposed that a Wireless Dinner Club should be formed. Membership of the Club should be confined to those who had done wireless work during the Great War as officers or in an equivalent capacity, Sir Henry Jackson kindly consenting to be the first president.

### THE AIR CONFERENCE.

The verbatim report of the proceedings at the Air Conference held in the Guildhall on Feb. 7th and 8th, 1922, has now been published by the Stationery Office, and may be obtained from H.M. Stationery Office, Imperial House, Kingsway, or through any stationer at the price of 3s. net, or 3s. 4d. post free.

Among the many speeches made at that conference there is to be found quite a fair amount both of interesting information and of common sense, and the report should have a definite value, more particularly as guide to the current opinion of a certain class of the community, to all who are seriously concerned with aviation.

### THE ROYAL AERO CLUB.

A meeting of the Committee was held on April 26th. On the motion of Brig.-Gen. Sir Capel Holden, K.C.B., F.R.S., the retiring chairman, seconded by Lt.-Col. Alec. Ogilvie, Lt.-Col. J. T. C. Moore-Brabazon, M.C., M.P., was unanimously elected chairman for the current year. On the motion of Lt.-Col. Mervyn O'Gorman, C.B., Lt.-Col. F. K. McClean was elected Vice-Chairman.

The Racing Committee is as follows:—Maj.-Gen. Sir Sefton Branker, K.C.B., Lt.-Col. W. A. Bristow, Lt.-Col. M. O. Darby, Col. F. Lindsay Lloyd, C.M.G., C.B.E., W. O. Manning, N. C. Neill, Howard T. Wright.

The Technical Committee is as follows:—Lt.-Col. A. Ogilvie, C.B.E., Lt.-Col. Mervyn O'Gorman, C.B., Howard T. Wright, Capt. W. G. Aston, Griffith Brewer, Eng.-Com. W. Briggs, R.N., Maj. R. H. Mayo.

And the House Committee is as follows:—Maj. H. Graeme Anderson, Ernest C. Bucknall, F/Lt. L. H. Cockey, Maj. Herbert J. Corin, D. C. MacLachlan, J. Stewart Mallan, Capt. D. G. Murray, Capt. L. V. Pearkes.

It was decided to hold a banquet, probably in June, to celebrate the 21st anniversary of the formation of the Club. The arrangements were left to a Sub-Committee consisting of Maj.-Gen. Sir W. S. Branker, K.C.B., Brig.-Gen. Sir Capel Holden, K.C.B., F.R.S., Lt.-Col. F. K. McClean, and Mr. E. C. Bucknall.

# PERSONAL NOTICES.

## DEATHS.

O'GORMAN.—At Heliopolis, Egypt, on April 26th, as the result of a flying accident, F/Lt. Edward Gerald O'Gorman, M.B., B.Ch., R.A.F., Medical Service, 4 F.T.S., R.A.F., Abu Suir, Egypt.

## IN MEMORIAM.

RHODES-MOORHOUSE.—In proud and most loving memory of William Barnard Rhodes Rhodes-Moorhouse, V.C., who dies at Merville in France on April 27th, 1918, from wounds received the day before when bombing Courtil Junction.

## MARRIAGES.

GOBLE.—WODEHOUSE.—On April 25th, at St. Martin-in-the-Fields, Wing/Cmdr. Stanley James Goble, D.S.O., O.B.E., D.S.C., to Kathleen, daughter of Lt.-Col. F. W. Wodehouse, C.I.E.

WATSON.—DONNALD.—On April 27th, at St. Mark's, North Audley Street, W., Capt. Henry Gilbert Watson, M.C., formerly of the Manchester Regt. and R.A.F., only son of Mr. and Mrs. Herbert Watson, of Hermongers, Rugeley, Sussex, to Kathleen Margaret, only daughter of Mr. and Mrs. B. Graham Bonville, of 38, Weymouth Street, W.

## BIRTHS.

BENTLEY-DACRE.—On April 25th, at Hoo St. Mary, Rochester, to Elizabeth Frances, wife of Sqd./Ldr. G. Bentley-Dacre, D.S.O., R.A.F.—a son.

GREENFELL.—On April 23rd, at 80, Fordwych Road, West Hampstead, Violet, the wife of Wing/Cmdr. G. P. Greenfell, D.S.O., R.A.F., of a son.

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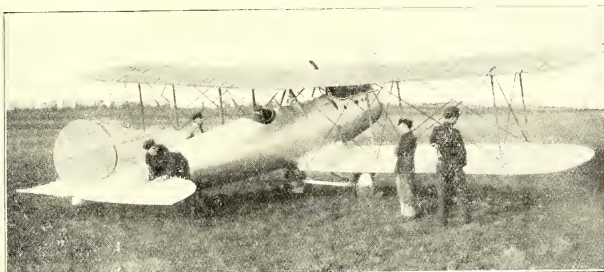
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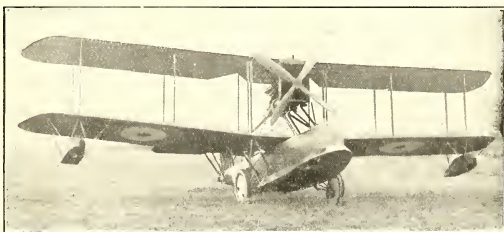
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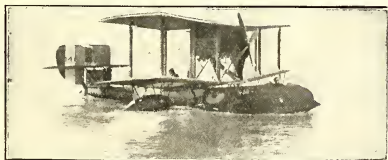
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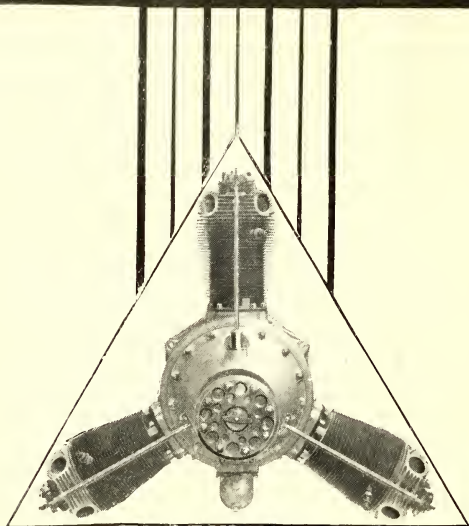
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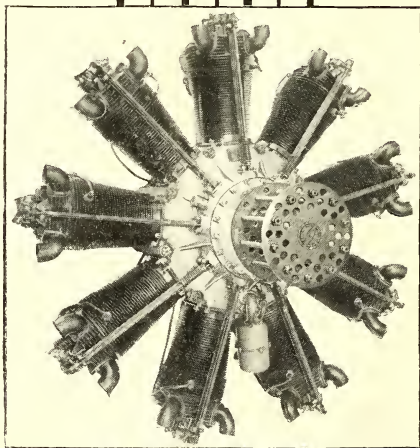
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## ON SOUTH AFRICAN AVIATION.

It was a quaint freak of Fate which decreed that the Government of the one British Dominion which has done least to encourage aviation should be the particular Government to profit before all the other British Dominions by the existence of its Air Force. While the Canadian Air Board has been doing really first-class work in demonstrating the use of aircraft for other than military purposes and has at the same time organised a highly efficient little Air Force, and while Australia has started subsidised Air Mail Lines and has formed the nucleus of an aerial coast defence, the South African Government has done little to develop aviation since 1912 when Mr. Compton Paterson opened a flying school at Kimberley.

Immediately after the war various plucky individuals started private enterprises in passenger carrying, while spotting and so forth, but one after another they have gone out of existence. Some of them have been killed while flying, either owing to inexperience or to antiquated machines, others have carried on till their money has been exhausted. The last survivors, the brothers Frank and Shirley Solomon, kept going with an ancient D.H.6 until a few weeks ago, when they crashed their machine and almost made up their minds that it was not worth while to begin rebuilding it. None of these pioneers in South African Civil Aviation have received the slightest help or even encouragement from the Government, despite the fact that several of them have demonstrated at their own expense or at the expense of an intelligent newspaper such as the "Johannesburg Star" that air mail lines can be of advantage in a country where the average railway rate is about fifteen miles an hour and where every railway travels something like twice the distance that an aeroplane would have to cover between any two given points.

Several years ago Mr. Howard Flanders, now Secretary of the Institution of Aeronautical Engineers, published in THE AEROPLANE a very comprehensive article demonstrating the possibility of running air lines as a commercial proposition in South Africa. All these years later South Africa is still without either Government or capitalistic support for Civil Aviation, and this despite the fact that South Africa probably includes more capitalists per cent. of the white population than any other country in the World, considering that the bulk of the white population are either farmers or mine owners or managers.

### Help from Home.

Towards Military Aviation the South African Government has been very little more intelligent than it has been in its attitude to Civil Aviation. Soon after the Armistice the British Air Ministry presented to the South African Government sufficient equipment to found and to maintain for some years quite a respectable little Air Force, and for nearly three years nothing was done with it. As a matter of fact, very little is known in this country, or presumably elsewhere in the British Empire, concerning the way in which the Air Ministry has helped South Africa in this respect.

It seems very well worth while, therefore, to publish in full an article on the South African Air Force which appeared on March 25th in that excellent and enterprising paper "The Motor Weekly" of Bloemfontein. The said article gives practically all available figures not only for the equipment presented by the Imperial Government but for the South African Air Force itself as it existed in March of this year. The article reads as follows:—

### THE SOUTH AFRICAN AIR FORCE.

#### PROGRAMME, PROGRESS AND ACTIVITIES SINCE ITS INCEPTION.

A review of the programme, progress and activities of the South African Air Force since its inception by Colonel Sir H. E. van Rensveld, K.B.E., D.S.O., in February, 1920, has just been published. As was recorded in "The Motor Weekly" at the time, the programme for 1921-22 was to establish a headquarters depot, and one squadron of three flights, each of six machines, and the present proposal is to establish another squadron during 1922-23. This means that

the Union Air Force is now employing about 23 officers and 250 non-commissioned officers and men, and by March, 1923, will have about 48 officers and 350 non-commissioned officers and men.

#### PRESENT DEVELOPMENT.

With the addition of the Director of Air Services there is a small nucleus of officers and men of the Permanent Force who have had all the necessary Air Force experience during the war to enable the foundations to be laid. The foundation of the Air Force is the ground organisation, and the Permanent Force nucleus mentioned is proceeding apace with the work in this connection.

#### IMPERIAL GIFT.

The inception of the South African Air Force is being made almost entirely with the Imperial gift of 100 aeroplanes, together with complete spares and equipment to maintain them for a year. Some idea of the value of this gift and the enormous asset it is and will continue to be to South Africa may be formed from the following approximate details of its composition:—One hundred aeroplanes, complete with engines, spare engines; transport vehicles, including workshop lorries, 3-ton lorries, light tenders and cars, motor cycles and trailers; steel framework for twenty permanent hangars for housing aeroplanes; thirty wooden and canvas Bessoneau hangars housing aeroplanes, and stores; complete wireless equipment for fitting up two squadrons of aeroplanes of eighteen machines each; complete photographic material for two squadrons; 50,000 gallons of special aeroplane engine oils; 20,000 gallons of paints, varnishes, and dopes; tools to equip completely the South African Air Force mechanics; spares for one year; and the largest and most valuable item—complete workshop machinery to enable any kind of aircraft, aeroplane and transport repairs and overhaul work to be done.

Practically all of this equipment has now arrived in South Africa, and experts are agreed that in quality and value it is 50 per cent. better now than it was six or twelve months ago, as it has become seasoned and set to the completely different climatic conditions of South Africa, under the ideal conditions of storage. This applies particularly to the aeroplanes, the structure of which is almost entirely made of wood. It is interesting to remark that the woodwork of the machines on which Major Miller carried out his recruiting campaign during 1916 is still in perfect condition.

#### AIRCRAFT DEPOT.

At present the depot situated at Roberts Heights, Pretoria, with its aeroplane repair, engine repair, transport repair, and store sections is being completed and organised for future operations, which are dependent on the smooth working of the depot. Similar work in connection with the establishments, conditions of service, etc., is proceeding. During the year a Headquarters' Staff and Clerical Section were formed to deal with all matters affecting the permanent organisation of the South African Air Force. The photographic, wireless, armament, balloon, and medical sections were in process of formation. The organisation of No. 1 Flight was commenced at Pretoria (Zwartkop Aerodrome, near Roberts Heights). No. 2 Flight will be formed as soon as possible. Negotiations for aerodrome sites and the erection of hangars were in progress, as actual flying operations obviously cannot be undertaken on a large scale until proper housing for the working machines is provided.

The ground organisation having been partially completed, the requirements of the Air Force as to personnel were advertised throughout South Africa. This ensured that the Air Force would get the pick of what is already recognised to be the best flying and technical material in the world.

#### POLICY.

The policy of the Department is to provide a small but well-selected body of officers, warrant-officers, non-commissioned officers, and men, and train and maintain them at the highest standard of efficiency in the theory and practice of warfare under modern conditions, with particular regard to the conditions of warfare which might have to be encountered by the

forces when employed in defending and maintaining the security and integrity of the Union.

As long as the idea still prevails that the art of flying is dangerous and is relegated to persons who have exceptionally intrepid qualities not much progress beyond the present stage of air development will be made. In the South African Air Force the object aimed at is to make flying, in the case of an officer, bear the same relation to his duties and accomplishments as riding in the case of an infantry officer.

Provided it does not interfere with the work to which he was primarily appointed and does not clash with his ground duties, or if he cares to put in extra time in order to learn, and is considered a suitable subject, any non-commissioned officer or man who desires will be taught to fly. If he passes his qualifying tests and attains the necessary standard of proficiency, he may be granted the privilege of wearing wings. This privilege will carry no extra pay. The advantage of being able to fly, from the man's point of view, is that, being a pilot, he now stands a chance, when vacancies occur, of being appointed to commissioned rank. He must, of course, possess the necessary educational and other qualifications to fit him for a commission in the South African Air Force.

#### EXISTING ORGANISATION.

The present organisation is as follows:—

(a) Headquarters, comprising staff, clerical section, photographic section, armament section, wireless section, and balloon section.

(b) Aircraft Depot, consisting of staff, permanent guard, administrative office, mechanical transport repairs, engine repair workshops, aeroplane repair shops, clerical (repair shops), miscellaneous services, miscellaneous repair, aeroplane stores, and balloon stores.

(c) One Squadron, consisting of one Headquarters Flight and three Air Flights. The latter may be any combination of S.B., 5 Flight, Avro Flight, D.H. 9 Flight, and D.H. 4 Flight, with six machines to each flight.

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#### The Thwarted Revolution.

The foregoing account should give the reader a fairly clear understanding of the constitution of the South African Air Force to-day. With that knowledge in hand it is possible better to follow the operations of the South African Air Force in the recent rebellion by the Revolutionary element among the mine operators on the Rand. In this connection it is well to remember that the S.A.A.F. was not a force in being

#### THE NEW C.G.C.A.

As this paper goes to press it is made known that Major-General Sir Sefton Branker has been appointed Controller-General of Civil Aviation. General Branker is essentially a man of action, and has an excellent record as a Staff Officer. He is a fervent believer in flying and should make a success of his new appointment if anybody can.—C. G. G.

#### RE-CONDITIONING.

On May 4th Mr. Baldwin RAPEL asked the Secretary of State for Air how many men are being employed at the Royal Aircraft Establishment on experimental work, and how many on reconditioning two machines?

Captain GUEST: The answer to the first question is approximately 606; to the second, none at present, but four or five will be shortly employed on reconditioning two of the machines used for experimental purposes.

Mr. RAPEL: Is it not a fact that this work of reconditioning machines could be carried out much better by civil aviation firms, and that it would be far more economical and would help to keep these firms going?

Captain GUEST: If the hon. Member will study the reply he will see that 606 men are employed on experimental work, and not on reconditioning, and that only four or five mechanics are to be employed on reconditioning two experimental machines. Recconditioning is being done by the trade.

[One is strongly under the impression that Captain Guest has been misled, at any rate to the extent that work which might well be regarded as reconditioning is being charged as experimental. Also it would be of interest to know what the personnel of the R.A.E. other than the 606 + 4 or 5 are doing. Nobody who has seen the mob of men emerging from the "Factory" at meal-times can believe that the number of hands is only 611 at a maximum.—C. G. G.]

#### THE CIRCUMNAVIGATION PROJECT.

One understands that the aircraft to be used in Mr. Norman

at the time of the outbreak. The flying was chiefly done by war-time aviators who rushed to join the Air Force when fighting began.

For the benefit of those who pay little attention to newspaper reports concerning matters outside England it may be well to recall that on March 10th last an attempt was made to establish a Bolshevik control of Johannesburg and the mining area pertaining thereto. What the Revolutionaries hoped to achieve and how they expected to obtain supplies of food or to dispose of the products of the mines even if they had succeeded temporarily in obtaining possession of the whole area is beyond the comprehension of any intelligent being.

The attempt on their part was singularly stupid in view of the fact that South Africa is essentially a capitalist community. Every Boer farmer owns his farm and is therefore a capitalist, tenant farmers are almost unknown, and except for niggers the agricultural wage worker scarcely exists. Consequently the overwhelming weight of opinion among the white population was entirely against the anarchistic miners.

However shortsighted may have been the views of the South African Government on the subject of aviation there is no doubt about their rightmindedness and their promptitude in dealing with the attempted revolt. The Government promptly declared Martial Law and mobilised the South African Army with the same promptitude that the same Government mobilised its commandoes to put down De Wet's rising at the beginning of the recent war, and with the same promptitude that the Governments of Presidents Kruger and Steyn mobilised their commandoes at the beginning of the South African War. The South African Dutch farmer may be slow in some of his ways, but he is remarkably prompt in turning out as an armed citizen against the enemies of his domestic peace.

#### The S.A.A.F. in Action.

The result was that on the very morning of the outbreak, March 10th, Martial Law was proclaimed in the whole Johannesburg area and the little South African Air Force was brought into action at once. The actual fighting was in the mining area and thither the aeroplanes were directed. Two or three machines were sent off to Benoni with instructions to use their machine-guns on the Trades Hall, which was the Headquarters of the rebels. Another machine was sent to the Brakpan mines.

The observer in this machine was Capt. Carey Thomas, who will be remembered by many officers and men of the R.A.F. In the course of the reconnaissance Capt. Carey Thomas was killed. The manner of his death was reported by his pilot as follows: "Saw a commando of about 200 men in the trees near east corner of Brakpan. Dived low down, nothing happened. Captain Carey Thomas instructed me to go lower. I dived again, still nothing happened so far as I could make out. I looked round, however, saw Captain Carey Thomas all crumpled up." The machine returned at 10.30 and it was found that Capt. Thomas had been shot through the heart.

(To be continued.)

MacMillan's attempt to fly round the world are now being made ready at the Waddon Depot of the Aircraft Disposal ("Puma"), a Fairey F. III (Rolls-Royce "Eagle") and an F. 3 Flying Boat (two Rolls-Royce "Eagles") have been bought by those financing the flight.

Mr. MacMillan hopes to start from Croydon on May 24th Company from whom the machines, two D.H. 9s (Siddeley) on the D.H. 9. This machine he will use as far as Calcutta. From there, whence he is due to leave on July 1st, to Vancouver he will use the Fairey. Leaving Vancouver possibly on August 14th, on a second D.H. 9, he hopes to get as far as St. John's, Newfoundland. The F. 3 will be used for the last stage to Labrador, Greenland, Iceland, Faroe Islands and Scotland, which should begin about September 1st if the voyagers attain so far.

As entirely standard machines are being used the flight will at any rate be interesting. As the flight will call for any amount of endurance on the pilots' part, the second pilot must also be one of the stamp of Mr. MacMillan. The second pilot mentioned is Major Wilfred Blake, who, one believes, is responsible for the organisation. Major Blake, as already mentioned, possesses plenty of nerve and at the same time quite a medium of common sense. As a pilot he has done comparatively little flying, and this was several years ago. Therefore he cannot possibly have the experience that is essential for such a flight.

Major Blake as a sportsman would be the first to decry any attempt to install in the Oxford or the Cambridge boat a journalist with merely a working knowledge of London County Council pleasure craft on the Serpentine, and being in a way responsible for the organisation and keen for the success of the venture, one feels sure that he will substitute a skilled pilot or skilled engineer in his stead, for the general good of British Aviation, which is the object he has at heart in promoting the flight.—C. D.

#### A CHANCE FOR THE TRADE.

The Aircraft Industry will do well to remember that on Fri-



day, May 10th, a visit will be paid to the Croydon Aerodrome by those attending the International Congress which is being held from May 17th to May 20th, under the auspices of the Institute of Transport. Delegates from the British Dominions, the United States and the Continent are taking part in this Congress, and though there are alternative attractions for those attending the Conference on that day it is practically certain that the newest method of transport will attract the majority of the delegates.

Therefore one suggests to the Aircraft Industry that it will be well worth the while of every firm which can afford to do so to send one or more representative machines of their construction to Croydon on that day, and if possible to offer free flights to members of the Congress. One would further suggest to aircraft firms that if they intend to participate in the education of the members of this Congress they would do well to communicate with the Hon. Secretary, Mr. H. E. Blein, C.B.E., at 15, Savoy Street, W.C. 2.

Doubtless the Institute will be issuing a programme for the day to those who intend to visit Croydon, and it would no doubt impress the existence of the various firms on the members of the Congress all the more strongly if the names of the firms appear on the programmes.—G. G. G.

### BRITISH MACHINES FOR LE BOURGET.

In writing of the Nice Aviation Meeting one lamented the fact that British Aviation was not represented at an International affair which included French, Italian, and Belgian aviators. This was possibly due to the fact that no British aviators were specifically invited to be present. It is earnestly to be hoped that British Aviation will not in the same way appear to be non-existent at the Aviation Meeting at Le Bourget on May 25th, 26th, 27th, and 28th.

This meeting is being promoted by the Society of Pilot Aviators who took their Certificates before 1914, and call itself "Les Vieilles Tigres." The President of the Society is Monsieur Leon Bathiat, who may be remembered by some of the veterans of the motor trade as a popular figure in cycling circles in Coventry about the year 1895, when he was an apprentice at the Humber Company before motors existed. Monsieur Bathiat will also be remembered by veteran aviators as the pilot of that early Breguet biplane which we used to call the "Coffee Pot."

M. Raffalovich, the Commissaire Generale of the meeting, writes that he has already sent letters to various British aircraft firms requesting them to send representatives to the meeting, but that so far no English firm has signified any desire to participate. On the other hand French, Belgian, Italian, and even Spanish aviators have already engaged themselves to appear. Surely under the circumstances it is worth the while of one or two British firms to send machines to this meeting.

Expenses would be practically nothing, in that the meeting takes place at the Paris Terminal Aerodrome at Le Bourget, and one is under the impression that free housing will be provided for the machines of competitors. Thus the only actual expense involved is the petrol expended in flying from London to Paris, and perhaps a few pounds extra for the pilot's expenses while in Paris. There are no big prizes

to be won, but there is a still better prize, namely, establishing before a cosmopolitan crowd at the most important of French aerodromes the fact that Great Britain still has a few aeroplanes and a few aviators.

All over the World one hears of French, Italian, and German aviation missions and aircraft commercial travellers, while England is scarcely represented at all. In fact, if it were not for the enterprise of the Aircraft Disposal Company and the very solid business which they are doing with foreign governments the ordinary public of other nations might very well think that flying has ceased so far as Great Britain is concerned. It is therefore all the more important that some British representatives should appear at the meeting of The "Vieilles Tigres" at Le Bourget.

### THE WHITSUNTIME AIR RACES.

The Third Air Race Meeting of the Royal Aero Club will be held at Croydon on Saturday, June 3rd, starting at 3 p.m. The events will be as follows:—

1. THIRD CLUB HANDICAP (Prize £20).—Open to all types of machines with a speed not exceeding 120 m.p.h. Distance approximately 16 miles.
2. EXHIBITION FLYING by the Gloucestershire Aircraft Co.'s "Bamel."
3. FIRST SPRING HANDICAP (Prize £20).—Open to all types of machines with a speed of over 120 m.p.h. Distance approximately 16 miles.
4. BALLOON SHIPING. Shot-guns. Entry £1. No charge for machines.
5. FIRST WHITSUNTIME HANDICAP (Prize £50).—If five starters the second will receive £20. Open to all types of machines with a speed of over 100 m.p.h. Distance approximately 24 miles.
6. PARACHUTE DEMONSTRATION.
7. EXHIBITION FLYING.
8. SURREY OPEN HANDICAP (Prize £30).—If five starters the second will receive £10. Open to all types of machines. Distance approximately 16 miles.

The Entry Fee for each event is £1. This fee, together with the Entry Form, must be received by the Royal Aero Club, 2, Clifford Street, London, W.1, not later than 5 p.m. on Monday, May 26th, 1922.

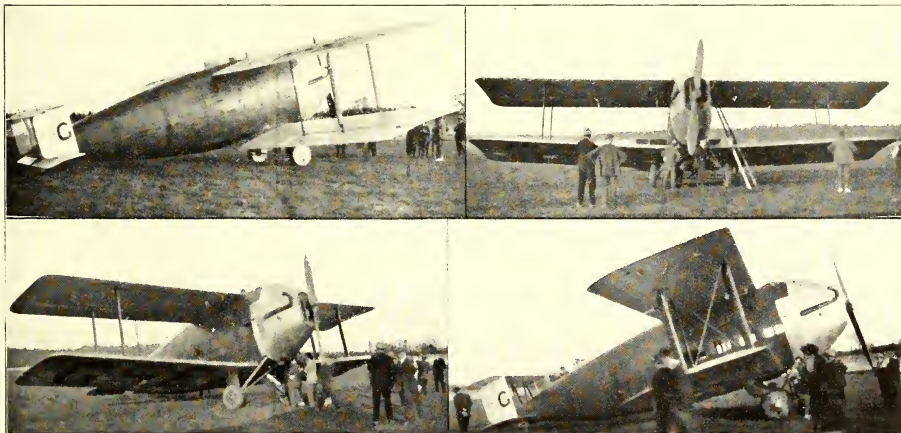
The Aircraft Disposal Company Ltd. have certain machines available for the Races, and they will be prepared to consider applications for the hire of these from qualified pilots. Applications should be made direct to the Company at Waddon Aerodrome, Croydon.

Three 2-seater Avros belonging to the Royal Aero Club will also be available. Qualified pilots wishing to take part in the Races may hire any of these machines from the Club at £3 for each event, which will include cost of petrol, oil and insurance of machine. Applications for these machines should be made direct to the Club.

Further particulars of the Races may be obtained from the Secretary, 3, Clifford Street, Bond Street, W.1.

### THE AIRSHIP SERVICE.

The scheme for the operation of an Imperial Air-ship Service which has been advanced by Commander Burney is at present being considered by the Treasury.



THE LATEST AIR LINER:—The new Vickers 9-seater "Vulcan" (Rolls-Royce "Eagle") photographed at Brooklands on Sunday evening just after her first test flight. She was designed by Mr. Rex Pierson and has been acquired by the Instone Air Line.

It is reported that the Air Ministry has found itself unable to raise any serious technical objection to the scheme, but is nevertheless averse to its acceptance on the ground that the £50,000 odd which would be required from the public funds would be better spent on the encouragement of Imperial aeroplane services.

But the Admiralty having shown signs of a real interest in the Airship Scheme, the Air Ministry finds itself faced with the alternatives either of supporting the Airship Scheme itself or seeing it come into being under the aegis of the Admiralty. It is believed that the Air Ministry will in fact give the scheme its support rather than risk the Admiralty having a finger in the pie.

### AIR MAILS IN PARLIAMENT.

In the course of his speech on the Post Office Estimates in the House of Commons on May 4th the Postmaster-General (Mr. Kellaway) said that the progress made in the carriage of mails by air both in this country and in other countries had not realised the like of the expectations of a few years ago. The last year, however, had shown greater progress than any previous year. There will be three services

to Paris by different companies, the mails to be sent by which is the most convenient.

Air Mails will leave Croydon by 10.00 hours and 12.15 hours. A service to Brussels will start on May 15th, and to Holland after that date, and there will be two outward services, one at 10.00 hours and one at 14.00 hours. Mr. Kellaway went on to say that the air parcel post to Paris effected a saving of from 5 to 6 days, this being primarily due to the fact that the Customs facilities for dealing with air parcels are much greater than with parcels in the ordinary way. The charges for parcels by air mail are to be reduced this year.

He said, "It is most successful of all the air mail services with which this country is associated is that from Cairo to Baghdad. A letter sent from London to Baghdad in the ordinary way takes from 28 to 30 days, but by air service it takes only 12 days. Ten per cent. of the whole of the Baghdad letter mail is now being sent by air, and the efficiency and reliability which the Air Ministry has reached in this service will, I think, assure in the future that there shall be a great extension in the use of the air mail in that district."

Mr. Kellaway added that he could visualise the time when they would be able to provide similar services throughout the Empire. A Civil Aviation Advisory Board had been formed by the Air Ministry with a representative of the Post Office upon it to consider the cost and practicability of setting up an Imperial Air Mail Service. They are first directing their attention to the Cairo-Baghdad and the Baghdad-Bombay sections of a possible future Imperial Air Route to India and to Australia.

## R.A.F. INTELLIGENCE.

### Appointments.

**S/Ldrs.** T. W. Elsdon, from R.A.F. Depot to Egyptian Group H.Q., 25/4; W. C. Hicks, A.F.C., from R.A.F. Depot to H.Q. Iraq (Superintendency), 21/4; H. Hurries, A.F.C., from H.Q. C.A., to H.Q. R.A.F. Iraq (Superintendency), to command Armoured Car Company (on formation), 21/4; E. R. Manning, M.C.E., from No. 2 F.T.S., to command No. 6 Sqdn. (Iraq), 21/4; L. Auker, O.B.E., from the Packing Depot, to command the Stores Depot (Iraq), 21/4; P. C. Sherrin, from No. 60 Sqdn. (India) to R.A.F. Depot (Superintendency), 28/3.

**F/Lts.** W. A. K. Dalziel, from No. 1 F.T.S. to No. 4 F.T.S. (M.E.), 25/4; A. C. Ramsford, from K.F. Depot to School of T.T. (Men), 6/4; T. Henderson, M.C., A.F.C., from School of T.T. (Men), to No. 100 Sqdn. (I.A.), 1/5; G. T. Richardson, from R.A.F. Depot, to No. 100 Sqdn., 1/5; A. W. Smith, from No. 8 S.D., to No. 4 F.T.S., 15/5; A. E. Barrism, M.B., from School of T.T. (Men) to H.Q. R.A.F., 22/4; E. F. Turner, A.F.C., from School of T.T. (Men) to No. 70 Sqdn. (Iraq), 21/4. The following F/Lts. to H.Q. R.A.F. Iraq, 21/4:—D. O. Mulholland, A.F.C., from No. 100 Sqdn.; H. A. Bowen, from R.A.F. Depot; H. A. J. Wilson, O.B.E., from Record Office; F. J. Cooke, from No. 1 S.D.

### New Units in Iraq.

In addition to the Units already stationed in Iraq the following appear in the May issue of the Air Force List under the heading of "Units to Form."

Aircraft Depot; Central Supply Depot; Baghdad Signal Section; Armoured Car Wing H.Q.; Nos. 3, 4, 5 and 6 Armoured Car Companies; Basrah Group H.Q.; Base Supply Depot; Basrah Signal Section; R.A.F. Prisoner Rest Camp; Armoured Train; Inland Water Transport Section.

### R.A.F. Cadetships.

The Air Ministry announces that an examination for entrance into the R.A.F. Cadet College, Cranwell, will be held on June 27th, 1922, and following days.

The number of Cadetships open to competition at this examination will not be less than 20 inclusive of King's Cadets or Honorary King's Cadets, and will include the award of not less than one prize Cadetship.

In addition, one Wakfield Scholarship of the value of £75 per annum is offered for competition, particulars being contained in the Regulations referred to below.

The competition will be conducted in accordance with the Regulations for the R.A.F. (Cadet) College (Air Publication 121), which may be obtained from H.M. Stationery Office, Imperial House, Kingsway, W.C.2. (Price 3d.).

Forms of application should be completed and returned not later than May 11th, and no application received later than May 25th will be accepted under any circumstances.

### R.A.F. SPORTS AND PASTIMES.

#### The Imperial Services Boxing Championships.

The organisation being in the hands of the R.A.F. this year, the Services' Boxing Championships were held at Hulton on May 3rd and 4th.

The Army won the team championship with 41 points, the Navy scoring 33, the R.A.F. 26, and the Marines 24. Details are as follows:—

#### OFFICERS.

**FEATHER-WEIGHTS:** Final, Lt. I. L. Cronyn (Army) beat Lt Hunt (Marines) on points. In the semi-finals Mr. Cronyn beat F/O G. V. Howard (R.A.F., Flowerdown) after an extra round.

**LIGHT-WEIGHTS:** Final, Lt. H. A. Spencer (Army) beat F/O H. G. Rowe (207 Sqdn. R.A.F.) on points. In the semi-finals Mr. Rowe beat Sub-Lt. Kitcat (R.N.C.) on points.

**WELTER-WEIGHTS:** Final, Maj. Martel (Army), beat Lt. Jerome (R.N.) in the second round, the referee stopping the fight. In the semi-finals Lt. Shillito (Marines) beat F/O A. J. Adams (R.A.F. Sch. of P.T.) on points.

**MIDDLE-WEIGHTS:** Final, Lt. Bayley (R.N.C.) beat Lt. Schooles (Army) on points. In the semi-finals Lt. Bayley beat F/O H. E. Farrow (R.A.F., 1 P.T.S.) in the first round.

**HEAVY-WEIGHTS:** Final, Maj. Huntingdon (Army) beat Capt. Shephard (Marines) on points. In the semi-finals Capt. Shephard beat F/O J. T. Hall (R.A.F., 24 Sqdn.) in the third round.

### OTHER RANKS.

**FLY-WEIGHTS:** Final, O.S. Harrod (R.N.) beat Pte. Clench (Army) on points. In the semi-finals Harrod beat AC. Izard (R.A.F. Depot) on points.

**BANTAM-WEIGHTS:** Final, Pte. Evans (Army) beat AC. Ballantyne (R.A.F., Leuchars) on points. In the semi-finals Ballantyne beat Cpl. Fort (Marines) on points.

**FEATHER-WEIGHTS:** Final, AC. Carter (R.A.F. Depot) beat Q.M.S. Mills (Army P.T. Staff). In the semi-finals Carter knocked out Sgt. Crawshaw (Marines) in the first round.

**LIGHT-WEIGHTS:** Final, Sgt. Miller (Army) beat P.O. Smith (Navy) on points. In the semi-finals Smith beat Sgt. Stone (R.A.F. 1 P.T.S.) on points.

**WELTER-WEIGHTS:** Final, AS Hall (R.N.) knocked out Sgt. Davey (Marines) in the first round. In the semi-finals Davey beat AC. Brady (R.A.F. Flowerdown) on points.

**MIDDLE-WEIGHTS:** Final, Cpl. Higgins (R.A.F.) knocked out AC. Lasby (R.N.) in the first round. In the semi-finals Higgins beat Sgt. Crawley (Army) on points.

**LIGHT-HEAVIES:** Final, Stoker Miller (R.N.) w.o. Sgt. Praddock (Marines) injured. In the semi-finals Praddock knocked out AC. Fairbairn (R.A.F. Cranwell) in the first minute.

**HEAVY-WEIGHTS:** Final, Sgt. Ring (Marines) beat AC. Hankinson (R.A.F.) disqualified. In the semi-finals Hankinson knocked out SS/M. Young (Army) in the third round.

### Fencing.

The Navy and Air Force met for their return fencing match at the R.A.F. Fencing School, Uxbridge, on the 27th. The Navy were not at full strength, but the fencing was of a high order and the contests very interesting.

The Air Force won the foils by 6 victories to 3. The Navy adopted the Italian style and their attacks were consequently of a very vigorous nature, whilst the Air Force fenced in the French style, their touches being most acedemical.

The Epées were rather one-sided—the Air Force winning by 9 clear victories. In the Sabres the Navy were victorious by 7 victories to 2.

### Golf.

The R.A.F. beat the R.N. at Berhamsted on April 30th by 9 points to 6. The details of the play were as follows. In each case the R.A.F. representative mentioned first.

**Foursomes.**—F/Lt. H. Hayward and S/Ldr. G. H. Thomson, 1; Cmdr. F. R. Barry and Cmdr. R. Wilson, 2; F/Lt. C. Bounphrey and F/Lt. N. W. Wadhwa, 0; S/Cmdr. Rusack and Lt./Cmdr. Johnson (1 up), 1; Air/Cmdr. D. Munro and F/O D. Craik (4 and 3), 1; Cmdr. J. Write and Lt./Cmdr. J. B. Falls, 0; S/Ldr. J. C. M. Lowe and Wing/Cmdr. J. T. Cull (5 and 4), 1; Lt. W. S. Gray and Cmdr. Bruce, 0; Wing Cmdr. R. Peel Ross and F/Lt. H. H. Clarke (3 and 1), 1; Paymaster Peace and Capt. D. Moir, 0.

**Result:** R.A.F. total 3½; R.N. total 1½.

**Singles.** R.A.F.—Hayward (1 up) 1; Lowe (3 and 2) 1; Cull 0; Clarke (3 and 2) 1; Craik 0; Thomson 0; Bounphrey 0; Wadhwa (1 up) 1; Munro (4 and 3) 1; Peel Ross ½. Total, 5½. R.N.—Barry 0; Gray 0; Bruce (3 and 1) 1; Moir 0; White (2 and 1) 1; Wilson (1 and 1) 1; Rusack (2 and 1) 1; Joinson 0; Falls 0; Peace ½. Total, 4½.

### Personal Notices.

**CLEAVER—MCREYNOLDS.**—On May 6th, at Paris, France, Charles Thornton Cleaver, M.C., D.F.C., late Capt., R.F.C., 34, Hanover House, London, N.W., sixth son of the late Richard Stewart Cleaver, of Liverpool, and Ruth, his daughter of Mrs. J. F. McCreynolds and the late J. F. McCreynolds, of Paris, Texas, U.S.A.

**KILBURN—TOPPIN.**—On April 23th, Anthony Conning Kilburn, late R.A.F. Scout, son of Mr. and Mrs. C. Conning Kilburn, of Broadstone, Dorset, to Maud Isabella, eldest daughter of Mr. and Mrs. Charles Toppin, of the College, Malvern.

**MACKAY—GOODCHILD.**—On April 20th, at St. Mary Magdalen's Church, York, Frederick Mackay, R.A.F., to Sonia Mary, daughter of Mr. and Mrs. George Goodchild, 26, Vernon Terrace, Brighton.

# NAPIER

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"At the commencement of the Instone Air Line's third season on the London-Paris Air Service, we think that it is only fair to let you know the splendid results obtained with the Napier 450 h p. Aero engine fitted to our machines.

"Last season the Instone Napier-engined machines travelled over 70,000 miles without an accident of any kind.

"Undoubtedly the Napier has proved itself most reliable and economical in actual service, in fact, thoroughly trustworthy, enabling us to supply an efficient and regular service.

"You will no doubt be pleased to hear that one of your engines has just been taken out of a machine after completing 200 hours' flying without an overhaul—a truly remarkable performance—and even at the end of that period it was only taken down as a precautionary measure."

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Aeroplanes  
for  
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Flying Boats  
for  
Commercial and  
Naval Use.



The Vickers "Viking" was classified FIRST in the following competitions at the INTERNATIONAL SEAPLANE COMPETITIONS at ANTWERP, July 1920.

1. Shortest time in "unsticking" from water.
2. Fastest time over a given circuit.
3. Climb to 1,000 metres.
4. Altitude with full load

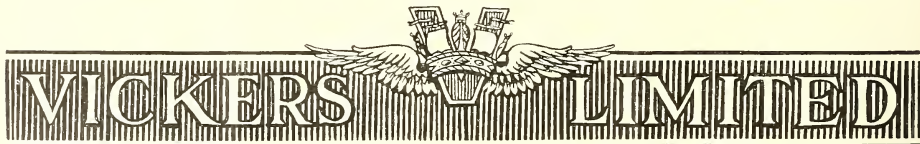
Depots:

MANCHESTER: Millgate Buildings,  
Long Millgate.  
BIRMINGHAM: Vickers House,  
Loveday Street.  
NEWCASTLE: Commercial Union  
Buildings, Pilgrim Street.  
GLASGOW: Vickers House, 247,  
West George Street.  
BRISTOL: 55, Park Street.  
BELFAST: 26A, Arthur Street.  
LEEDS: Greek Street Chambers,  
Park Row.

Brief Specification:  
Viking Mark IV

6 Passengers and  
baggage or 1,560  
lbs. Freight.  
RANGE 340 miles.  
SPAN: 50' 0"  
HEIGHT: 15' 1"  
LENGTH: 35' 0"

The Vickers "Viking" was the winner of the FIRST prize of £10,000 for the Amphibian Class of Aircraft entered for the BRITISH AIR MINISTRY COMPETITION, September, 1920.



Aviation Department,  
VICKERS HOUSE, BROADWAY, LONDON, S.W.1.

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.

# AERONAUTICAL ENGINEERING

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INCORPORATING AIRCRAFT ENGINEERING, AERODYNAMICS, AIRCRAFT FINANCE AND COMMERCIAL AERONAUTICS AND MATTERS PERTAINING TO THE AERONAUTICAL ENGINEER AND THE AIRCRAFT TRADER.

## THE WEEKLY COMMENTARY.

There is reproduced below a design by Herr Dornier, for a single-seat fighting "pusher-type" machine, which bears a remarkable likeness to a suggestion made by Capt. Sayers as to how an efficient pusher might be made.

The main features of the official report on the characteristics of the successful tanks entered for the recent Air Ministry Crash and Fire-proof Tank Competition are reproduced in this issue.

It is extremely gratifying to discover that, in the opinion of the Judges, the result of the competition shows that the three successful tanks mark a distinct advance

on previous standard types in the matter of safety against fire.

A summary of the results of the successful type test recently made under Air Ministry observation on the Bristol "Lucifer" air-cooled engine and a specification of the engine itself are published in this issue.

The result of this and of the previous test on the same firm's "Jupiter" engine are fairly conclusive proof that the air-cooled radial engine is now able to compete in regard both to economy and reliability with water-cooled engines of the highest class.

## HOW AN EFFICIENT PUSHER MIGHT BE BUILT.

Apropos the sketch bearing the above title which illustrated the last of the series of articles on "The Commercial Aeroplane," in the issue of April 12th, a German correspondent contributes the following interesting statement:—

"When two different persons have the same or very similar ideas for the securing of the same ends it is always interesting as evidence to the general soundness of those ideas. It may therefore be of interest to describe briefly a design for an efficient all-metal single-seater prepared in 1918 by Dipl Ing. Dornier, which in some respects is very similar to that suggested by Capt. Sayers.

"The origin of Herr Dornier's design was the desire to produce a machine giving to the pilot the best possible view, and avoiding the troubles which are encountered with the tractor type in arranging for machine-gun fire through the airscrew. It will be remembered that long before the war fuselage machines with the airscrew behind the tail had been built (for example, the Paulhan-Tatin of 1911). This arrangement called for long airscrew shafts and led to trouble in arrangement of the power plant. Machines with airscrews behind the wings were also quite common, but the usual type of pusher had many disadvantages, such as that of high resistance, due both to the engine installation and to the tail

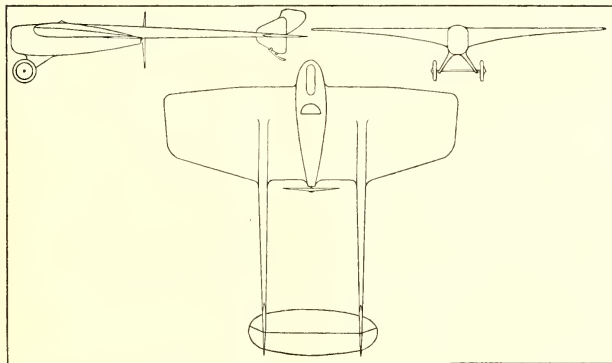
boom bracing, as well as the objection that with the engine behind type the pilot was in grave danger if the machine stood on its nose in landing.

"Replacement of the open tail booms by twin streamlined fuselages had been used as early as 1912, in a little German sporting machine known as the Trinks, and also in a Nieuport water-plane.

"Herr Dornier's design, shown in the attached sketch, places the engine in front of a streamline nacelle, and drives a pusher airscrew at the rear of that nacelle by a short shaft, thus avoiding any extreme difficulty with transmission and giving the advantage that the engine is ahead of the pilot."

Apart from this fact, and the use of a separate under-carriage, the Dornier design is extraordinarily like Capt. Sayers' scheme. It will be recollected, however, that Capt. Sayers' scheme was based on the assumption that not only might it be necessary to get the airscrew behind the wings to achieve any very high efficiency, but also that it might be found inadmissible to leave the pilot's head projecting.

It is not possible completely to enclose the pilot and still give him a reasonably good view if the engine is in front, and on these assumptions the engine naturally goes to the rear.



### HERR DORNIER'S PROJECT FOR AN EFFICIENT "PUSHER."

This sketch shows a design prepared by Herr Dornier before the end of the War, which bears a remarkable resemblance to the pusher suggested in this paper on April 12th by Capt. Sayers.

The design is discussed in the note above.

## THE SAFETY FUEL TANK COMPETITION.

The Air Ministry has now issued some data as to the tanks submitted for test in the competition for Crash and Fire-proof tanks. The awards in this competition were announced in *THE AEROPLANE* of last week.

It will be remembered that by the rules governing the competition each competitor was required to submit two tanks for preliminary trials, and that the three most successful competitors in the first stage should submit four more tanks for final trial.

### METHOD OF TESTING.

The method of testing the tanks in the preliminary trials was as follows:—

Each tank was mounted in a wooden structure similar in construction to the fore part of the ordinary tractor small type aircraft. The concrete body formed to represent an engine was mounted in front of the tank. The structure containing tank and engine was released down an "I" section girder runway approximately 100 ft. high, so arranged that the body struck the ground at an angle of approximately 45 degrees to the horizontal. It was originally intended to crash the structure on a concrete bed. It was however found necessary to modify the conditions, and the bed was covered with a 2 feet 6 inch depth of sand. The conditions then briefly were those of the typical aircraft crash, the engine partially burying itself, the tanks coming into violent contact with the engine. As however the fuselage structure at the moment of impact had attained a velocity of approximately 50 m.p.h. the conditions were more severe than would prevail in a crash from which a human being could hope to escape with his life. The test was intentionally made thus severe in order definitely to reveal weakness or bad points in design.

In the final trials the following tests were imposed:—Two tanks of each type were submitted to acceleration and crashing tests, and the remaining two to firing tests, the acceleration test being arranged to impose stresses approximately equivalent to four times that due to gravity.

The tanks mounted in the fuselage structure were fixed to a pendulum raised to the requisite height and released by a trip gear. A tank of each type submitted to this test was given two swings and was then placed on one side for 10 to 15 minutes, at the end of which, from outside examination, nothing untoward had occurred.

The Crashing Tests were carried out in a similar manner to that adopted for the Preliminary Tests with the exception that flints were substituted for sand on the crashing bed.

The tanks submitted to firing test were mounted to their fuselage structures and subjected to bursts of five pounds of Vickers machine-gun fire, composed of 1 armour-piercing, 1 incendiary, 2 armour piercing and 1 incendiary.

### JUDGING.

A system of judging was adopted whereby each judge was enabled to record an independent opinion on a common basis. For the preliminary tests this system was on the following basis:—

As regards weight, the basis of 100 marks was taken as representing a tank, which, complete with fittings, conformed to the specified weight of 1.75 lbs. per gallon capacity.

For each variation of a decimal point of this weight capacity ratio, 6 marks were added or deducted from the 100 marks.

As a means of correction in the case of tanks whose capacities were outside stipulated limits the following formula was adopted:—

*Marks X reqd. capacity.*

*Actual capacity.*

Tanks received marks for the attributes in the following proportion: (a) Crash-proof qualities 100 marks max., and (b) Remaining attributes 100 marks max.

(b) Was divided up as follows:—

Duration under Service conditions in the absence of accidents 25 marks; Indifference to extremes of temperature 25 marks; Adaptability of design to large capacities 10 marks; Simplicity of construction 10 marks; Adaptability of design to various shapes to marks; Accessibility of fittings 10 marks; Cost of production 10 marks.

In awarding marks for the various attributes stated above, the ordinary mild steel service tank was taken as a standard.

This resulted in the following competitors being placed at the end of the Preliminary Tests: 1st, Commander F. L. M. Boothby; 2nd, Messrs. Imber Anti-Fire Tanks Ltd, 3rd, India-Rubber, Gutta Percha and Telegraph Works Co. Ltd.

In the final tests the marking was on the following basis:—  
100 marks maximum for each crash test.....200  
100 marks maximum for each firing test.....200  
100 marks maximum for remaining attributes.....100

Total. 500

The final result was:—1st, India-Rubber and Gutta Percha Co; 2nd, Imber Anti-Fire Tanks; 3rd, Commander Boothby.

### DESCRIPTION OF WINNING TANKS. ...

Details of the tanks submitted by the three winning competitors for the preliminary tests are as follows:—

THE INDIA-RUBBER AND GUTTA PERCHA CO. LTD., SILVERTOWN, LONDON.

No. 1.	No. 2.
Weight of tank .....78.75 lbs.	Weight of tank .....81.25 lbs.
Capacity of tank .....37.7 galls.	Capacity of tank .....38.2 galls.
Weight per gall. capacity 2.08 lbs.	Weight per gall. capacity 2.15 lbs.
Shape of tank .....Cubical.	Shape of tank .....Cubical.

Each consisted of a welded sheet steel rectangular tank with no frame or baffles of any sort, but with each side slightly dished inwards, inserted in a detachable rubber ease.

These tanks were slung in the fuselage by means of webbing.

THE IMBER ANTI-FIRE TANKS LTD., TOTTENHAM, LONDON.

No. 1.	No. 2.
Weight of tank .....50 lbs.	Weight of tank .....51.5 lbs.
Capacity of tank .....30 galls.	Capacity of tank .....29.3 galls.
Weight per gall. capacity 1.66 galls.	Weight per gall. capacity 1.76 lbs.
Shape of tank .....Elliptical.	Shape of tank .....Elliptical.

The tank consisted of a light gauge tinued steel shell which was separated from the inside by a framework of aluminium tubing and light gauge aluminium baffle plates. After assembly the whole of the tank had been covered with india-rubber of a suitable thickness, and all joints vulcanised.

COMMANDER BOOTHBY, TILFORD, SURREY.

No. 1.	No. 2.
Weight of tank .....33.25 lbs.	Weight of tank .....35.75 lbs.
Capacity of tank .....50.8 galls.	Capacity of tank .....53.7 galls.
Weight per gall. capacity 0.58 lbs.	Weight per gall. capacity 0.66 lbs.
Shape of tank .....Cubical.	Shape of tank .....Cubical.

The tank consisted of an inner bag of 4-ply rubbered fabric capable of containing the petrol with an outer cover of rubbered fabric which was gas tight. Non-inflammable gas was introduced into the space between the two shells and maintained under slight pressure. A drain pipe was fitted to the outer casing. The tank was fixed to the fuselage by rubber shock absorber and stringing and encased in 3-ply glued on.

### MODIFICATIONS FOR FINAL TESTS.

The three competitors qualifying for the final tests were required to submit four tanks of a type fundamentally similar to those entered for the preliminary trials, any minor modifications which it was desired to incorporate being previously submitted for the consideration and approval of the Judges' Committee. This resulted in the following departures being made with the consent of the Judges.

The India-Rubber Co. incorporated the following modification: (a) The metal of the fuel container was reduced from 20G to 26G; (b) The capacity was reduced to within the prescribed limits; (c) The tanks were internally coated with a lead deposit; (d) Light gauge baffle plates were introduced; (e) The method of attachment of the flap to the opening in the rubber cover was slightly modified; (f) The attachment to the fuselage altered in detail but not principle.

The Imber Anti-Fire Tanks Ltd. introduced compressed rubber buffers at the front of the tank, and in place of metal straps and turnbuckles for fixing the end cradles used leather thong.

Commander Boothby substituted a 3-ply outer casing in lieu of the outer fabric shell, and was requested by the Committee to reduce the capacity of the fuel container proper to agree with the terms of the regulations.

Each of these designs showed marked superiority in almost every respect to the standard service steel tank.

Details of these modified tanks are as follows:—

THE INDIA-RUBBER, GUTTA PERCHA AND TELEGRAPH WORKS CO. LTD.

No. 1.	No. 3.
Weight of tank .....57 lbs.	Weight of tank .....57 lbs.
Capacity of tank .....29 galls.	Capacity of tank .....29 galls.
Weight per gall. capacity 1.96 lbs.	Weight per gall. capacity 1.96 lbs.
Shape of tank .....Cubical.	Shape of tank .....Cubical.

No. 2.	No. 4.
Weight of tank .....54.5 lbs.	Weight of tank .....54.5 lbs.
Capacity of tank .....29 galls.	Capacity of tank .....28.8 galls.
Weight per gall. capacity 1.88 lbs.	Weight per gall. capacity 1.89 lbs.
Shape of tank .....Cubical.	Shape of tank .....Cubical.





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## THE IMBER ANTI-FIRE TANKS LTD.

No. 1.	No. 3.
Weight of tank .....52.5 lbs.	Weight of tank .....50.5 lbs.
Capacity of tank .....30 galls.	Capacity of tank .....29.7 galls.
Weight per gall. capacity 1.75 lbs.	Weight per gall. capacity 1.70 lbs.
Shape of tank .....Elliptical.	Shape of tank .....Elliptical.
No. 2.	No. 4.
Weight of tank .....51.5 lbs.	Weight of tank .....51.5 lbs.
Capacity of tank .....29.7 galls.	Capacity of tank .....29.5 galls.
Weight per gall. capacity 1.73 lbs.	Weight per gall. capacity 1.75 lbs.
Shape of tank .....Elliptical.	Shape of tank .....Elliptical.

## COMMANDER BOOTHBY.

No. 1.	No. 3.
Weight of tank .....36.5 lbs.	Weight of tank .....33 lbs.
Capacity of tank .....31.5 galls.	Capacity of tank .....31.5 galls.
Weight per gall. capacity 1.16 lbs.	Weight per gall. capacity 1.05 lbs.
Shape of tank .....Cubical.	Shape of tank .....Cubical.
No. 2.	No. 4.
Weight of tank .....35.5 lbs.	Weight of tank .....35.5 lbs.
Capacity of tank .....31.5 galls.	Capacity of tank .....31.5 galls.
Weight per gall. capacity 1.13 lbs.	Weight per gall. capacity 1.13 lbs.
Shape of tank .....Cubical.	Shape of tank .....Cubical.

## THE TYPE TEST OF THE BRISTOL "LUCIFER" ENGINE.

The Bristol Co.'s 3-cylinder air-cooled radial engine, the "Lucifer," which created such a good impression when fitted to the Bristol monoplane at the Royal Aero Club's Race Meeting on Easter Monday, has as has already been recorded, passed the very severe "Type Test" laid down by the Air Ministry. The Bristol "Jupiter" was the first air-cooled engine to pass this test. The "Lucifer" is the second, and only two other types of engine have yet succeeded in this ordeal.

There has long been a need for a simple, sturdy, reliable engine of moderate power for sporting and commercial purposes, and the "Lucifer" would appear to meet this demand. Its tests show that the fuel and oil consumption is low, its weight per h.p. is excellent compared to any other engine of a really reliable type, it is simple to mount and install, and it should be an ideal engine for training and for joy-riding machines.

The following particulars extracted from the report of the official trials will give an excellent idea of the performance of the engine.

The engine used for the trials was numbered 301, and was one of the first two experimental engines of this type. It had previously been used for experimental work, including flight tests in an Avro. It had run for 155 hours 14 mins. before the beginning of the type tests.

The tests were carried out mainly on the Bristol Co.'s test bed, described in the issue of May 3rd. The only exception was that 20 hours of the 50 hours' endurance test were made in a shed on an airscrew.

On January 25th a power curve test was made. This covered a range of speed of from 1,200 to 1,650 r.p.m. The maximum range of the brake mean effective pressure over this speed range was from 114 lbs. per sq. in. (at 1,650) to 122 lbs. per sq. in. (at 1,300 r.p.m.).

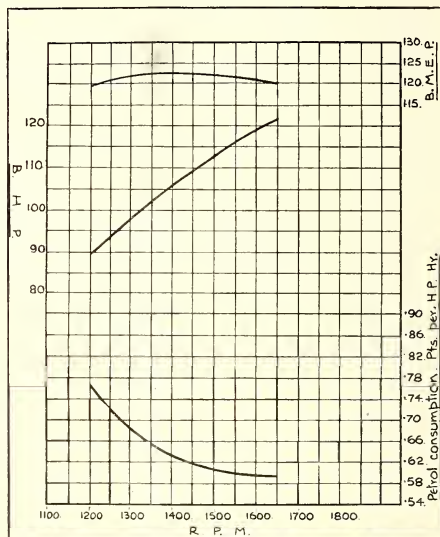
Thereafter 50 hours' endurance test at 90 per cent. of full power was run. Thirty hours of this was run on the dynamometer, and 20 hours on the airscrew. Two 10-hour non-stop runs were made, one on each load, and in addition another 9-hour run was made on the dynamometer, and a 6-hour run on the airscrew. The range of power during the 90 per cent. full power period was from 92.7 to 51 b.h.p. The final hour of the test was at full power, 102.4 b.h.p. The whole of this test was made at speeds between 1,600 and 1,607 r.p.m.

This was followed by one half hour slow running test at 740 r.p.m. Acceleration from this low speed was satisfactory.

A high speed (hearing) test of 1 hour was made at 1,822 r.p.m., followed by a 1-hour high power test, when 120.5 b.h.p. was developed at 1,655 r.p.m., with a petrol consumption of 0.613 pints of fuel and 0.031 pints of oil per h.p.

A second power curve test was then made, over the speed range 1,210 to 1,650 r.p.m. The B.M.E.P. varied only from 123 to 118 lbs. per sq. in. in this second test, and the engine was if anything developing a slightly greater power than at the beginning of the test.

The average fuel and oil consumption throughout these



The Power Curve of the "Lucifer" engine.

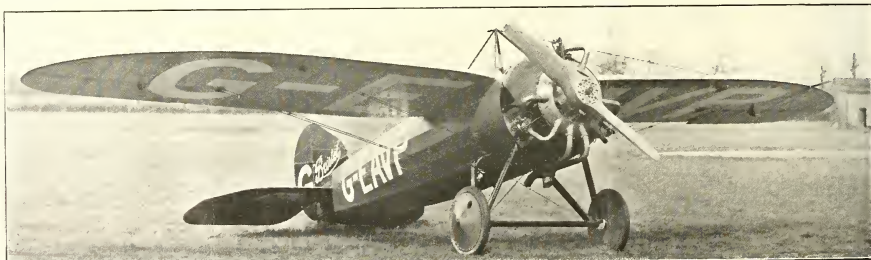
tests was: Petrol, 0.610 pints (0.55 lb.) per h.p. hour; oil, 0.036 pint per h.p. hour.

After these tests the engine was dismantled and found to be in excellent condition. One exhaust valve required to be replaced, but this failure was traced to faulty material.

On re-assembly the engine was submitted to additional tests under regulations made by the Director of Research in Feb., 1922. These tests are directed to the question of the maximum permissible r.p.m., and consist of 1-hour test at high speed and full throttle (1,760 r.p.m. and 118 b.h.p.), and one hour at 1,850 r.p.m. at low power.

The tests were throughout under the supervision of the A.I.D. The fuel used was 80 per cent. petrol and 20 per cent. Benzol.

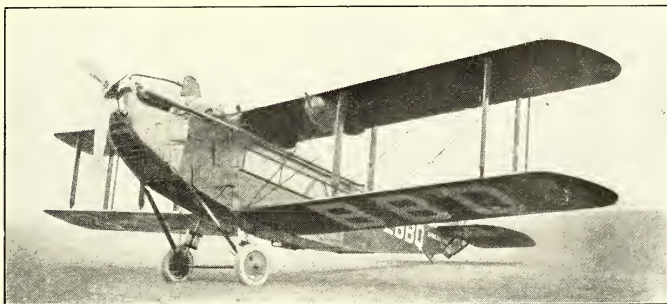
The specification hereafter given will give full details as to the dimensions, etc., of this engine.



The Bristol Monoplane with the 100-h.p. "Lucifer" engine which made so good an impression at Croydon on Easter Monday.

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## SPECIFICATION OF THE BRISTOL "LUCIFER" ENGINE.

No., type, and arrangement of cylinders—3 cylinders, air-cooled radial.	Specific gravity of oil.....0.94 Type of carburettor.....Caudel H.C.8
Bore .....5.750 in.	Mixture control .....Vacuum
Stroke .....6.025 in.	Method of heating.....Exhaust heater to air intakes
Stroke bore ratio .....1.086:1	Fuel consumption.....61 pints per hour
Stroke volume of one cylinder .....162.312 cu. in.	Fuel consumption per b.h.p. per hour .....0.610 pint
Total stroke volume of engine .....486.936 cu. in.	Magneto timing.....35 deg. before T.D.C.
Area of one piston .....25.967 sq. in.	Inlet valve opens .....10 deg. after T.D.C.
Total piston area of engine .....77.901 sq. in.	Inlet valve closes .....54 deg. after B.D.C.
Clearance volume of 1 cylinder .....42.70 cu. in.	Maximum lift of inlet valve .....0.468 in.
Compression ratio .....4.8:1	Clearance of inlet valve (hot) .....0.010 in.
Normal b.h.p. and r.p.m. (ground level) .....100 b.h.p. at 1,600 r.p.m.	Exhaust valve opens .....60 deg. before B.D.C.
Piston speed .....1,666 ft. per min. at 1,600 r.p.m.	Exhaust valve closes .....20 deg. after T.D.C.
Brake M.E.P. ....102 at 1,600 r.p.m.	Maximum lift of exhaust valve .....0.468 in.
Cu. in. of stroke volume per b.h.p. ....4.86	Clearance of exhaust valve (hot) .....0.010 in.
Sq. in. of piston area per b.h.p. ....0.779	Weight minus oil and fuel .....324 lbs. including heater box.
H.P. per cu. ft. of stroke volume .....356	Weight per b.h.p. minus oil and fuel .....3.24 lbs. including heater box.
H.P. per sq. ft. of piston area .....185	Weight of fuel per hour .....56 lbs.
Direction of rotation of crank .....Counter clockwise	Weight of oil per hour .....4.22 lbs.
Lubrication system.....Pressure Oil recommended	Total weight of fuel and oil per hour .....59.22 lbs.
Castrol "R"	Weight for six-hour run (fuel and oil) .....355.32 lbs.
Oil pressure recommended .....50 lbs. per sq. in.	Weight per b.h.p. for six hours (fuel and oil) 3.55 lbs.
Oil temperature recommended .....105-120 deg. C.	
Oil consumption per hour .....3.6 pints	
Oil consumption per b.h.p. per hour .....0.036 pint.	

## THE ROYAL AERONAUTICAL SOCIETY.

## OFFICIAL NOTICES.

Representatives on Other Bodies.—The following representatives have been nominated for the year ending April, 1923:—  
Conjoint Board of Scientific Societies—Lt.-Col. M. O'Gorman.

Aeronautical Research Committee—Lt.-Col. A. Ogilvie.  
Advisory Committee on Aeronautical Education—Professor C. F. Jenkin.

British Engineering Standards Association Aircraft Committee—Lt.-Col. M. O'Gorman.

R.E.S.A. Aircraft Sub-Committee No. 1 (Nomenclature)—Professor L. Bairstow, Lt.-Col. M. O'Gorman, Dr. Sutton Phippard, Mr. J. D. North, Major R. V. Southwell, Lt.-Col. W. Lockwood Marsh.

Civil Aviation Advisory Board—Lt.-Col. M. O'Gorman.  
International Air Congress, 1922—Organising Committee—Mr. Griffith Brewer, Lt.-Col. M. O'Gorman, Lt.-Col. A. Ogilvie, Lt.-Col. W. Lockwood Marsh (Technical Secretary).

## R.Ae.S. Students.

The following is the immediate programme of the Students' Section of the Royal Aeronautical Society:—

Wednesday, May 31st.—Visit to the Royal Aircraft Establishment, Farnborough. Meet at 8.45 a.m. for special tickets at Booking Office, Waterloo Station (L. & S.W.R.) for the 9.0 a.m. train from Waterloo.

Saturday, June 3rd.—Visit to the National Physical Laboratory, Teddington. Meet at 9.15 a.m. for special tickets at the Booking Office, Waterloo Station (L. & S.W.R.).

Students are requested to give in their names immediately for the visits they wish to attend in order to obtain cheap travel facilities. The Hon. Secretary will meet students at place and times mentioned for issue of these tickets. The Hon. Secretary is Mr. Stanley H. Evans, the Royal Aeronautical Society, 7, Albemarle Street, W.1.

## A COMPREHENSIVE GUARANTEE.

Riders of Ridge-Whitworth Aero-Special Bicycles will be interested to hear that henceforth these machines will be guaranteed against defects in material and construction without any time limit. Since 1907 Ridge-Whitworth guaranteed all their bicycles for ten years, but in future the guarantee is everlasting. The guarantee applies to all parts of the machine with the exception of saddles, chains, variable gears, coaster hubs, enamelled plating, aluminium parts and flexible parts such as springs. These parts are, however, guaranteed for a year from the date of purchase. Ridge-Whitworth's action is certainly fairly courageous, as it means in fact that they guarantee their bearings to last for ever.

## THE INSTITUTION OF AERONAUTICAL ENGINEERS.

On Friday, April 28th, a paper was read before the Institution of Aeronautical Engineers, by Capt. W. H. Sayers, on "Unsettled Problems of Aeroplane Design."

Capt. Sayers said that the present basis of aeroplane design depended on two assumptions: one that the resistance of similar bodies varied as the square of the air speed and as the cross sectional area of the body, and the other that the resistance of any complex body might be taken to be equal to the sum of the resistances of the component parts. It was admitted that neither of these assumptions was strictly true, but within fairly close limits most standard type aeroplanes behaved as though the assumptions were correct.

If the assumptions were accurate they imposed limits to the probable extent of possible improvement in complete aeroplanes and it was important to consider whether it was safe to allow aeroplane designs to be limited by assumptions whose accuracy was subject to some doubt.

The lecturer then proceeded to instance cases of actual aircraft which had shown performances widely different from those predictable on these assumptions and others which might more or less arise from them, and finally suggested that it was quite possible that the fact that the average aeroplane performed very much as the assumptions would lead one to predict was more due to the fact that aeroplane design had become standardised and only types were used which did closely conform to the designer's prediction.

He felt that there was a certain amount of evidence that it was not the case that resistances of components could safely be added to arrive at a measure of the resistance of the whole machine. That, in fact, it was quite likely that it was possible to build a complete aeroplane with a very much lower total resistance than that of its component, and even that it might be possible to build a complete machine which had a better L/D ratio than that of the isolated wings.

If this were the case it was important that designers should abandon the habit of regarding an aeroplane as an assembly of components, and get into that of regarding it as one single body to be designed to produce lift at the expense of the minimum of drag.

The paper was followed by an interesting discussion in which Capt. Goodman Crouch, Mr. W. O. Manning, Major Gnosspelius, and Dr. A. P. Thurston took part. The discussion revealed a general consensus of opinion that the two basic assumptions which Capt. Sayers had held up to doubt were certainly not to be regarded as rigidly accurate, and that there was need for very much greater research into the problems upon which he touched.

## A FINE PERFORMANCE.

Appropos the very fine weight lifting performance of the Fairey Transatlantic seaplane which was recorded in this paper on January 18th, last, Mr. J. Lankester Parker, of Short Bros., who is now in Japan, writes to point out that the "Short" machine which was built for the North Atlantic flight put up an equally remarkable performance in April, 1919.

With a low compression Rolls-Royce "Eagle" engine, Mr. Parker climbed this machine to 6,000 ft. at a total loaded weight of 8,400 lbs. The load included 435 gallons of petrol, 30 gallons of oil, 18 gallons of water, crew of two, food, maps, instruments, electric light, electrically heated clothing, and ordinary and directional wireless. This performance was the more remarkable that in order to give the engine every chance on its long flight an airscrew was fitted which limited the engine to 1,400 r.p.m. on the ground.

## A SEA-GOING SEAPLANE.

It is announced that the Supermarine Aviation Works Ltd. have under instruction for the Air Ministry a really large sea-going machine, intended to operate with the Fleet at sea under the most difficult of weather conditions.

With their very extensive experience of sea-going craft, the Supermarine firm are confident that this machine, when completed, will be so great an advance on all previous machines of a comparable type as to render everything heretofore designed completely obsolete.

## INSTRUMENTS IN NEWFOUNDLAND.

The recent work of Mr. Sidney Cotton in Labrador, which has received its due appreciation in the issue of May 2nd, was carried out under conditions which made navigation difficult and arduous, and called for instruments of the greatest reliability. It goes almost without saying that Mr. Cotton used Smith's instruments.

But it is of some special interest to hear that Mr. Cotton, before leaving for Newfoundland, took delivery from Smiths of a Bannett-Bennett periodic compass which has so far been supplied for civilian aircraft.

## MORTGAGES, CHARGES &amp; SATISFACTIONS.

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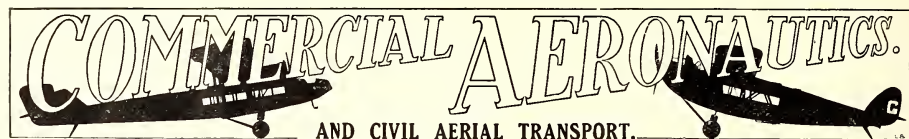
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## THE UNITED KINGDOM OF GREAT BRITAIN AND IRELAND.

### CONTINENTAL ARRIVALS AND DEPARTURES.

[The following table of arrivals at and departures from the British Air Ports is compiled on the following system:—First comes the initials of the Air Line; next the type of machine; next the international number of the machine; next the ports of departure and destination; next the times of departure and arrival; next the cargo, whether goods (G) and/or mails (M); next the number of passengers; and finally the name of the pilot and number of mechanics, if any.]

ABBREVIATIONS:—A.D.—Aircraft Disposal Co. B.A.—Berkshire Aviation Co. B.C.—Bristol Aeroplane Co. C.A.—Department of Civil Aviation D.A.—Daimler Airway D.H.—De Havilland Aircraft Co. G.E.—Compagnie des Grands Express Aériens H.P.—Handley Page Transport Ltd. I.L.—Instone Air Line K.L.—Koninklijke Luchtvaart Maatschappij L.A.—Leatherhead Aviation Services M.A.—Messageries Aériennes M.W.—Marconi Wireless Telegraph Co. Ltd. P.O.—Privately owned P.L.—Peters Ltd. S.F.—Surrey Flying Services S.N.—Syndicat National pour l'Etude des Transports Aériens (S.N.E.T.A.).

The London Terminal Aerodrome, Croydon. (Telephone: Croydon 2720.)

#### MAY 1st:

L.L., DH8, G-EARO, London-Paris, 06:58-08:29, G, Nil, Holmes & 1.  
M.A., Breguet, F-CMAG, London-Paris, 06:58-08:29, G, Nil, Range.  
D.A., DH34, G-EBSB, London-Paris, 06:58-08:29, G, Nil, Herne & 1.  
K.L., Fokker, H-NABK, London-Adlam, 10:00-12:20, G.M., 2, Warnar.  
D.A., DH34, G-EBSB, London-Paris, 12:50-14:58, G.M., 1, Herne & 1.  
M.A., Goliath, F-FHMF, London-Paris, 13:05-15:03, G.M., 8, Coupet.  
I.L.P., Bristol, G-EAWY, London-Paris, 13:35-16:30, G.M., 3, Carter & 1.  
G.E., Goliath, F-FHMY, London-Paris, 14:00-16, G, Nil, Grasset & 1.  
M.A., Spad, F-ACMV, London-Paris, 06:58-09:03, G.M., Nil, Brice.  
D.A., DH34, G-EBSB, Paris-London, 12:50-14:58, G.M., 1, Herne & 1.  
H.P., H.P., G-EATH, Paris-London, 11:55-13:04, G, 10, McIntosh & 1.  
G.E., Goliath, F-ADPT, Paris-London, 12:14-13:47, G, 5, Favreau & 1.  
M.A., Spad, F-ADBH, Paris-London, 12:38-15:01, G, 1, Bontham.  
I.L., DH4, G-EAMU, Paris-London, 13:00-15:13, G.M., 2, Jones.  
M.A., Goliath, F-FHMO, Paris-London, 13:15-16:18, G.M., 1, Landre & 1.  
K.L., Fokker, H-NABM, Adlam-London, 14:12-17:25, G.M., Nil, Van der Hoop.  
D.A., DH34, G-EBSB, Paris-London, 13:50-17:40, G.M., 6, Herne & 1.  
M.A., Spad, F-ACMG, Paris-London, 10:50-19:40, G, 4, Delage.

#### MAY 2nd:

M.A., Spad, F-ADAE, London-Paris, 05:57-08:45, G, Nil, Brice.  
L.L., DH8, G-EAWW, London-Paris, 09:00-09:20, G, Nil, Powell.  
D.A., DH34, G-EBSB, London-Paris, 09:50-12:20, G.M., Nil, Robertson & 1.  
I.L., DH4, G-EAMU, London-Paris, 10:00-12:20, G.M., 2, Shepperson.  
K.L., Fokker, H-NABT, London-Adlam, 11:40-14:23, G.M., Nil, Silms.  
H.P., H.P., G-EATH, London-Paris, 12:18-15:05, G.M., Nil, Wilcockson & 1.  
D.A., DH34, G-EBSB, London-Paris, 12:18-15:05, G.M., Nil, Wilcockson & 1.  
M.A., Goliath, F-FHMO, London-Paris, 13:05-15:45, G, 1, Landre & 1.  
G.E., Goliath, F-GEAC, London-Paris, 11:40-17:00, G, 2, Favreau & 1.  
D.A., DH34, G-EBSB, Paris-London, 10:00-12:20, G.M., Nil, Robertson & 1.  
I.L., DH8, G-EARO, Paris-London, 11:30-14:00, G, 2, Holmes.  
G.E., Goliath, F-GEAO, Paris-London, 12:05-15:00, G, 4, Gastoux & 1.  
M.A., Goliath, F-ADAY, Paris-London, 14:20-18:20, G.M., 1, Challeux & 1.  
K.L., Fokker, H-NABD, Adlam-London, 14:32-17:25, G.M., Nil, Hofstra.  
L.L., DH8, G-EAWW, Paris-London, 13:27-18:02, G, 6, Powell.  
I.L., DH4, G-EAMU, Paris-London, 15:47-18:03, G.M., Nil, Shepperson.  
D.A., DH34, G-EBSB, Paris-London, 15:40-18:10, G.M., 2, Robinson & 1.  
H.P., H.P., G-EATH, Paris-London, 16:13-19:20, G, 8, Wilcockson & 1.

#### MAY 3rd:

M.A., Spad, F-ADBH, London-Paris, 05:53-08:53, G, Nil, Donlin.  
L.L., DH8, G-EARO, London-Paris, 09:22-09:40, G, Nil, Braddy.  
K.L., Fokker, H-NABM, Ldn-Adlam, 10:00-12:27, G.M., 2, Van der Hoop.  
L.L., DH8, G-EAWW, London-Paris, 11:20-14:05, G.M., Nil, Jones.  
H.P., H.P., G-EATH, London-Paris, 12:00-15:45, G.M., 2, McIntosh & 1.  
D.H., DH9, G-EAYU, London-Paris, 13:07-15:55, G, 2, Cobham.  
G.E., Goliath, F-ADDT, London-Paris, 13:00-17:34, G, Nil, Gastoux & 1.  
M.A., Goliath, F-ADAY, London-Paris, 14:20-18, G, Nil, Challeux.  
I.L., DH8, G-EARO, Paris-London, 13:52-16:40, G, 2, Brady.  
H.P., Bristol, G-EAWY, Paris-London, 12:13-15:00, G, 7, Carter & 1.  
G.E., Goliath, F-GEAC, Paris-London, 12:25-15:44, G, 7, Favreau & 1.  
I.L., DH8, G-EAWW, Paris-London, 15:00-17:35, G.M., 1, Jones.  
K.L., Fokker, H-NABX, Adlam-London, 16:01-19:50, G.M., Nil, Tyl.  
D.H., DH9, G-EAYU, Paris-London, 16:30-19:05, G.M., 1, Cobham.

#### MAY 4th:

M.A., Spad, F-ACMG, London-Paris, 05:40-08:04, G, Nil, Delage.  
L.L., DH8, G-EARO, London-Paris, 05:48-08:10, G.M., Nil, Holmes.  
D.A., DH34, G-EBSB, London-Paris, 07:00-10:10, G.M., 1, Herne & 1.  
H.P., DH4, G-EAWH, London-Paris, 10:00-12:20, G.M., 2, Shepperson.  
L.L., DH8, G-EAWW, London-Paris, 10:10-12:20, G.M., 2, Shepperson.  
D.A., DH34, G-EBSB, London-Paris, 12:51-15:05, G.M., 1, Robertson & 1.  
H.P., W8, G-EERB, London-Paris, 13:22-15:55, G.M., 8, Wilcockson & 1.  
G.E., Goliath, F-CMAG, Paris-London, 06:52-09:25, G.M., Nil, Portal.  
D.A., DH34, G-EBSB, Paris-London, 09:40-12:22, G, 2, Hinchliffe & 1.  
L.L., DH8, G-EARO, Paris-London, 14:12-15:40, G, 2, Brady.  
H.P., H.P., G-EATH, Paris-London, 12:14-15:50, G, 10, McIntosh & 1.  
I.L., DH8, G-EAWW, Paris-London, 15:27-18:17, G, Nil, Shepperson.  
D.A., DH34, G-EBSB, Paris-London, 15:55-18:43, G.M., Nil, Robertson & 1.  
H.P., DH4, G-EAWH, Paris-London, 16:10-18:44, G, Nil, Desmire.

#### MAY 5th:

M.A., Breguet, F-CMAG, London-Paris, 05:45-08:28, G, Nil, Portal.  
L.L., DH8, G-EARO, London-Paris, 05:50-08:40, G, Nil, Powell.  
D.H., DH4, G-EBSB, London-Paris, 07:00-09:37, G.M., Nil, Hinchliffe & 1.  
K.L., Fokker, H-NABN, London-Adlam, 10:10-12:20, G.M., 2, Tyl.  
L.L., DH8, G-EAWW, London-Paris, 10:41-13:20, G.M., 3, Braddy.  
H.P., DH4, G-EAWW, London-Paris, 13:00-15:20, G.M., 8, Olvy.  
D.A., DH34, G-EBSB, London-Paris, 13:40-15:53, G.M., 1, Herne & 1.  
M.A., Breguet, F-CMAG, Paris-London, 06:20-09:45, G.M., Nil, Paille.  
D.A., DH34, G-EBSB, Paris-London, 10:17-13:04, G.M., Nil, Hinchliffe & 1.  
L.L., DH8, G-EARO, Paris-London, 11:30-14:40, G, 3, Powell.  
M.A., Goliath, F-FHMO, Paris-London, 13:20-17:18, G.M., 1, Coupet & 1.  
K.L., Fokker, H-NABD, Adlam-London, 14:40-18:41, G.M., Nil, Van der Hoop.  
I.L., DH8, G-EAWW, Paris-London, 15:18-18:36, G, 2, Braddy.  
D.A., DH34, G-EBSB, Paris-London, 16:02-18:38, G.M., 3, Herne & 1.  
H.P., W8, G-EERB, Paris-London, 16:05-19:36, G.M., 2, Wilcockson & 1.  
M.A., Spad, F-ACMT, St. Ing-Croydon, 10:05-19, G.M., Nil, Revenue.

#### MAY 6th:

L.L., DH8, G-EARO, London-Paris, 05:40-08:10, G.M., Nil, Holmes.  
M.A., Breguet, F-CMAG, London-Paris, 05:48-08:40, G, Nil, Paille.  
D.A., DH34, G-EBSB, London-Paris, 06:57-08:59, G.M., Nil, Robertson.  
K.L., Fokker, H-NABN, London-Adlam, 10:00-12:20, G.M., 1, Geyssendorfer.  
I.L., DH8, G-EAWW, Paris-London, 13:18-18:36, G, 2, Braddy.  
M.A., Goliath, F-FHMO, London-Paris, 13:50-14:15, G.M., 1, Coupet & 1.  
H.P., H.P., G-EATH, London-Paris, 12:20-15:17, G.M., 6, McIntosh & 1.  
D.A., DH34, G-EBSB, London-Paris, 13:00-15:15, G.M., 2, Hinchliffe & 1.  
M.A., Breguet, F-CMAG, London-Paris, 13:00-15:45, G.M., Nil, Range.  
M.A., Spad, F-ACMT, London-Paris, 13:12-15:50, G.M., 1, Revenue.  
D.A., DH34, G-EBSB, Paris-London, 09:30-11:13, G.M., Nil, Hinchliffe.  
L.L., DH8, G-EARO, Paris-London, 11:30-13:40, G, Nil, Holmes.  
G.E., Goliath, F-ADDT, Paris-London, 11:32-14:30, G, 1, Gastoux & 1.  
H.P., DH8, G-EAWW, Paris-London, 12:50-15:30, G, 4, Carter.  
H.P., DH8, G-EAWW, Adlam-London, 14:12-19:20, G.M., Nil, Hofstra.  
D.A., DH34, G-EBSB, Paris-London, 15:48-18:40, G, 4, Robertson & 1.

#### MAY 7th:

L.L., DH8, G-EAWW, London-Paris, 10:35-13:25, G.M., 4, Jones.  
D.A., DH34, G-EBSB, London-Paris, 11:21-13:48, G.M., 4, Robinson & 1.  
M.A., Goliath, F-ADDO, London-Paris, 13:12-16:30, G.M., 1, Landre & 1.  
H.P., DH8, G-EAWW, London-Paris, 13:12-16:30, G.M., 2, Carter.  
M.A., Spad, F-ADBH, Paris-London, 06:10-08:53, G, Nil, Perignon.  
I.L., DH4, G-EERB, Paris-London, 11:35-13:47, G, 4, Powell.  
M.A., Goliath, F-ADT, Paris-London, 13:22-15:57, G.M., 2, Doonhen & 1.  
H.P., H.P., G-EATH, Paris-London, 13:30-16:05, G, 4, McIntosh & 1.  
D.A., DH34, G-EBSB, Paris-London, 12:22-16:10, G.M., 6, Robinson & 1.  
L.L., DH8, G-EAWW, Paris-London, 14:14-16:54, G.M., Nil, Jones.

### Inland Flying at Croydon.

May 1st.—S.F., Avro, joy-rides (Muir).  
May 2nd.—S.F., Avro, joy-rides (Muir).  
May 3rd.—D.H., D.H., from Stag Lane (Cobham); H.P., W.8b from Marlesham (Payne).  
May 4th.—I.L., DH34, tests (Instone pilots); D.H., D.H.9 to Stag Lane (Cobham); H.P., W.8, joy-rides (Muir).  
May 5th.—I.L., Westland from Yeovil (Barnard).  
May 6th.—I.L., D.H.34, tests (Instone pilots); M.W., Avro test (Shaw); S.F., Avro joy-rides (Muir); P., D.H.6 joy-rides (Yates).  
May 7th.—S.F., Avro, joy-rides (Muir); P., D.H.6, joy-rides (Yates); R.A.C., Avros, Brooklands return (Vincent and Shepperson).

### Flying by the Aircraft Disposal Co.

May 1st.—Avro, G-EECT, test (Stockey).  
May 2nd.—Avro, G-EEDT, test (Stockey); Bristol Fighter, G-EEDB test (Stockey).  
May 3rd.—D.H.9, test (Stockey).  
May 4th.—3 D.H.9s, tests (Stockey).  
May 5th.—3 D.H.9s, tests (Stockey).  
May 6th.—Bristol Fighter, G-EECT, left for Brussels (Foot).

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## Cross-Channel Statistics.

Week ending May 7th:—  
 Machines, 199; Passengers, 234; Crews, 156; Total Personnel, 390  
 Corresponding week last year:—  
 Machines, 65; Passengers, 227; Crews, 79; Total Personnel, 366  
 Corresponding week, 1920:—  
 Machines, 84; Passengers, 126; Crews, 96; Total Personnel, 222

## The London Terminal Aerodrome.

The Aircraft Disposal Company have had a fairly busy week of it. On Monday Mr. Stocken tested an Avro. The following day he again took up the same machine and later on a Bristol fighter. On Wednesday, Thursday, and Friday he made seven tests on D.H.9s.

On Saturday, Major Foot left for Brussels on a Bristol fighter, returning the following day by boat and train. On Sunday afternoon Mr. Muir was testing the Martinsyde flown by Mr. Longton in the races. He had hired the machine from the A.D.C. in order to fetch photographs of the Royal visit from Belgium the following day.

The Handley Page W8b came back from Martlesham on Tuesday, where she passed her tests with ease. Later in the week she made her maiden trip to Paris and on the way back, a tail-skid was damaged in landing at Lympne.

This was repaired and the machine returned to Croydon, and later went on to Cricklewood for minor adjustments. The second W8b, named R.M.A. "Mellbourne," was tested at Cricklewood on Saturday, and came over to Croydon on Monday of this week. The first one should be over again by the time these notes are in print.

Mr. Larry Carter had a somewhat unusual experience one day last week. He took off Le Bourget on the Bristol with six passengers, and with Mr. Ponsonby in the spare pilot's seat. As he left the ground the port compression strut of the oleo undercarriage came apart from the axle, as they frequently used to do on the old F.E.2b. Mr. Carter was informed of this by Croydon by wireless, who, wonderful to relate, had received the news from Le Bourget before the machine arrived.

Le Bourget, so as to be quite free from any charge of being accurate, said that a wheel had come off in starting.

Great preparations were made for his reception at Croydon. A fire hose was run out onto the aerodrome and every available man of all companies was mustered and provided with a fire extinguisher, a chopper or other weapon—"in case," as Mr. Shaw said, "any of the passengers might still be alive after the crash"—and this army were stationed in scattered yet orderly formation all round the aerodrome.

Also a doctor and two nurses were fetched from Croydon, the ambulance was well laden with more men and more extinguishers, and all preparations were made for a wheel-less landing.

Meanwhile Mr. Ponsonby received minute instructions by wireless as to what to do, which instructions he duly passed on to Mr. Carter. As the machine arrived in sight excitement rose high and the "assassins" brandished their respective weapons. The machine duly landed, ran along on one wheel, stopped in a normal way, resting her port front spar neatly on the tyre of the strutless wheel. She was at once surrounded by the would-be rescuers. The passengers thought that in their absence there had been a Bolshevik rising, judging by the people with weapons. However, it was a good performance, and Mr. Carter is to be congratulated on his judgment, and Mr. Ponsonby on his liaison work.

The Instone Air Line received their D.H.34 from Martlesham on Wednesday, also a second one from Stag Lane.

Mr. Powell took the first machine to Paris on Saturday, returning on Sunday about midday. On Monday of this week the same machine went again to Paris flown by Mr. Brady, and Mr. Barnard took the new 34 to Brussels on the inauguration of that service. Many people gathered together for the "opening ceremony," which seems very aptly named.

Mr. Barnard brought one of the small Westlands acquired by the I.A.L. from Yeovil on Friday.

Now that May 1st has been passed without white hat covers being issued to the Instone Air Line it seems that attention should be directed to the oversight.

The Daimler Airway have been doing well with their double-decker service most days last week, and now that they have a new machine delivered they will soon be

able to run their promised four machines a day in each direction, using three machines, one being kept as a spare and also five spare engines. The get-off of the 34s is certainly improving, and doubtless in due course the machines will do all that is required.

Sunday was a very busy day, and the large crowd of spectators who gathered had full value for their time. Continental machines were departing and arriving continuously. Mr. Yates on his D.H.6 and Mr. Muir on his Avro were joyriding until dusk. Mr. Chapman came over from Leatherhead on his Avro. Mr. Vincent and a passenger left for Brooklands on a R.A.C.C. Avro soon after lunch, and Mr. Shepperson and oneself followed them soon after 17.00 hours, making Brooklands in nine minutes and returning in twelve minutes about 20.00 hours.

The Handley Page Bristol left for Paris after lunch, flown by Mr. Larry Carter, the passengers including Major Foot and Mr. Cogni.

On Monday morning of this week, Mr. Cockerell came over from Brooklands on the Vickers "Vulcan" for the Instone Air Line. This is painted the well-known blue, and is named the "City of Antwerp." The cabin is well fitted up and is of such a height that even General Festing could stand upright even if he increased his stature by half a cubit, which seems at the moment to be highly unlikely. Everyone was pleased with the exceptionally low landing and getting-off speed.

The Flying Dutchmen have been running with great regularity, and on May 15th they begin their twice daily service. Mr. Leverton expects to get the first F.III with an "Eagle" Rolls-Royce engine before then.—G. D.

## Brooklands.

Brooklands was really quite busy on Sunday afternoon from an aviate point of view. Soon after lunch, Mr. Vincent arrived from Croydon on a Royal Aero Club Avro on a visit to some friends. Soon after tea another Club Avro with Mr. Shepperson and oneself also arrived in order to see the Vickers "Vulcan."

At 18.00 hours the "Vulcan" emerged from the Vickers shed and followed by a "Viking IV," was taken on to the aerodrome. The method of getting a machine from the Vickers sheds to the aerodrome is somewhat tedious. The tail skid is lifted on to a "bogey" and the machine then taxied along the track clockwise right up to the old sheds along the Byfleet end where she enters the aerodrome by crossing the road.

Mr. Cockerell got into the Vulcan and taxied down about as far as the south end of the sewage farm. Here he opened up the "Eagle" Rolls-Royce, and with less than 100 yards run she was in the air, reaching 500 feet or so before passing over the track.

Mr. Cockerell took her up to 1,500 feet or so, and after playing around for fifteen minutes or so he throttled the engine down and proceeded to glide down. The gliding angle of the "Vulcan" is about the flattest thing one has yet seen, and when she touched the ground at about 40 m.p.h. one realised that Mr. Rex Pierson, her designer, had achieved another triumph. Mr. Cockerell, before the machine had stopped, held out his hand with the thumb extended upwards, thereby displaying his complete satisfaction.

Mr. Maxwell Muller, who was also present, Mr. Pierson and all the Vickers employees, who dealt with the machine, deserve every congratulation on the production of what appears to be a really fine commercial proposition. On the initial test 800 lbs. of ballast was carried.

After the successful maiden flight of the "Vulcan" Mr. Cockerell, with Mr. Shepperson as passenger, tested a "Viking IV" for the Spanish Government, after which Mr. Vincent and oneself proceeded to shed about a stone apiece in weight in attempting to swing the "props" of our respective Avros. Mr. Vincent won and got away ten minutes ahead climbing to 5,000 feet or so. We made up the time by coming across at 1,200 feet or so and arrived over Croydon just as the other machine was landing. Visibility was wonderful and we could see the Crystal Palace as soon as we got out of Brooklands.

In taking off from Brooklands one noticed that the sewage farm, of tender memories, looked as inviting as ever, though one has never previously realised how appallingly bad is the surrounding country for forced landings.—G. D.

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 "Anewtoyle," Vic., London. Victoria 257.8. .... 344

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Blackburn Aeroplane & Motor Co., Ltd., The Olympia, Leeds.  
 "Propellers," Leeds. Roundhay 601 (5 lines) ..... *Front Cover*  
 Bristol Aeroplane Co., Ltd., The, Filton House, Bristol "Avia-  
 tion," Filton. Bristol 3906 ..... *Back Cover*  
 De Havilland Aircraft Co., Ltd., The, Stag Lane Aerodrome,  
 Edgware. "Haviland," Edgware. Kingsbury 160-1, (2 lines) ..... 339  
 Roe, A. V., & Co., Ltd., Newton Heath, Manchester. "Triplane,"  
 Manchester. City 8530-1, Manchester ..... *Inside Front Cover*  
 Vickers, Ltd., Vickers House, Broadway, London, S.W.1  
 "Vickers," Vic., London. Victoria 6950 ..... 334

## AIRCRAFT DISPOSAL.

Aircraft Disposal Co., Ltd., The, Regent House, Kingsway, London,  
 W.C.2. "Airdisco," Phone, London. Regent 6240 (5 lines) ..... 339

## AIR LINES.

Instone, S., & Co., Ltd., 51, Leadenhall Street, London, E.C.  
 Avenue 3616-7-8 ..... 342

## CORDS, THREADS, TAPES AND WEBBING.

MacLennan, John, & Co., 115, Newgate Street, London, E.C.1.  
 "Vanduaan," Cent, London. City 3113 ..... 344

See  
 Advert.  
 Page

## DOPES.

Titanine, Ltd., Empire House, 175, Piccadilly, London, W.1  
 "Tetrafree," Piccy, London. Gerrard 2312, Regent 4728 .....  
*Front Cover & Inside Back Cover*

## ENGINES.

Bristol Aeroplane Co., Ltd., The, Filton House, Bristol. "Avia-  
 tion," Filton. Bristol 3906 ..... *Back Cover*  
 Green Engine Co., Ltd., The, 165, Piccadilly, London, W.1.  
 "Airengine," London. Gerrard 8165 ..... *Back Cover*  
 Napier, D., & Son, Ltd., 14, New Burlington Street, London, 333  
 "Nitrifier," London. Gerrard 8256 (4 lines) .....  
 Kolls-Royce, Ltd., 15, Conduit Street, London, W.1. "Rolland,"  
 Piccy, London. Mayfair 5040 (4 lines) ..... 337  
**FLOTATION AIR BAGS.**  
 R.F.D. Company, 21, Queen's Road, Hersham, Surrey ..... 344

## METAL PARTS AND FITTINGS.

Brown Bros., Ltd., Great Eastern Street, London, E.C.2. "Im-  
 browned," Bethroad, London. Bishopsgate 2100 ..... 341  
 Rattery, Owen & Co., Darlaston, South Staffs. "Rooks," Dar-  
 laston. Darlaston 87 (3 lines) ..... 341

## PARACHUTES.

Spencer, C. G., & Sons, Ltd., 56a, Highbury Grove, London, N.5  
 "Aeronaught," London. Dalston, 1953 ..... 341

## PROPELLERS.

Lang Propeller Ltd., Weybridge, Surrey. "Aerosticks," Wey-  
 bridge. Weybridge 520-521 ..... 344

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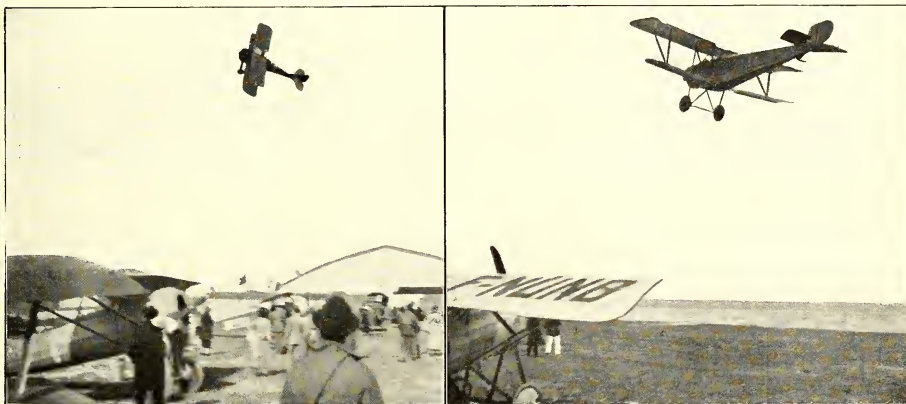
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SIXPENCE WEEKLY.

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## STAR TURNS.



FRENCH AVIATORS AT NICE.—On the left Capt. Madon is seen doing a climbing turn straight off the ground and on the right M. Sadi-Lecointe is making a "depart" a few feet over the other machines on the aerodrome.

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## ON SOUTH AFRICAN AVIATION.—(Continued.)

### A Near Thing.

The machines sent to Benoni were commanded by Colonel Sir Pierre Van Ryneveld himself, the Director of Air Services. It would seem that Col. Van Ryneveld had a remarkably narrow escape. It appears that he started on a reconnaissance before Martial Law had actually been declared and flew over the East Rand to locate the position of the rebels.

The *Motor Weekly* states that in order to do so he flew at somewhere about 200 feet and, somewhat naturally, was greeted with a hot fire from Lee-Metfords and Martini-Henris. His radiator and tank were hit and fourteen bullet holes were counted in his machine, some of these having apparently been fired almost horizontally, presumably from the tops of houses. Rather than risk falling into the hands of the rebels, whose savagery to their prisoners apparently equalled that of Russians or Iberian Irish, Colonel Van Ryneveld took the chance of being burnt alive, for though his petrol tank was emitting petrol freely he carried on till he was outside the rebel area and landed safely at Rietfontein, where he was picked up by the Government Forces.

Towards the afternoon the rebels were still holding their own and urgent messages from the attacking force showed that the most valuable operation would be the demolition of the rebel headquarters in the Trades Hall at Benoni. For some reason or another this could not be accomplished by the Transvaal Horse Artillery, and consequently aeroplanes were sent out to do the job. It seems that in this they were singularly successful, as the Hall was destroyed shortly after five o'clock.

It is reported that on this occasion the rebel leaders were killed, with the result that the organisation of the rebels was practically broken from that moment, and thereafter it was only a matter of breaking up the individual commands. Apparently in the course of these bombing operations a bullet fired by the Revolutionaries hit a bomb-rack in one of the machines, knocking off a bomb, which fell into the town of Benoni and killed a woman. Of course one is ignorant of the particular type of bomb used, and it is possible that such an accident might happen.

### Another Adventure.

These operations did not at once put a stop to the fighting, for the aeroplanes were still in use on Sunday, March 12th, on which day it was reported that certain officers of the South African Air Force had an escape at least as close as that of Colonel Van Ryneveld. According to the *Johannesburg Star* one of the machines suffering from engine or other trouble was compelled to land on a golf course near Melville. As soon as the machine landed it became a target for a number of rebels in the district. The pilot of a second machine, Mr. Hector Daniel, promptly went to the help of the first machine and landed alongside it. A third machine had meanwhile landed and taken off the two men from the first machine.

For some reason or another it seems that Mr. Daniel could not get his own machine off after landing, so he and his observer, Mr. Hammon, unshipped their Lewis guns and made a dash for a neighbouring watercourse, under fire from the rebels. Under cover of the gully they made their way to a farm, where they commandeered a cart and a couple of horses, and taking with them their Lewis guns they started for home. On the way they met a mounted rebel, who wounded Mr. Hammon and was himself shot dead by Mr. Daniel. Eventually he and his wounded observer managed to get into touch with Government Forces and reached safety.

### Testimony to Good Service.

Apart from these individual adventures the aeroplanes did the usual duties of reconnaissance, bombing and machine-gunning, and were, particularly useful in dropping ammunition and supplies of food to various Government Forces and police who had been cut off and surrounded by rebels at various points where they had been put on guard before the actual fighting began. Furthermore, they saved a good many lives by dropping leaflets at Fordsburg, warning peaceful inhabitants of impending bombardment and assault so that they had time to withdraw before fighting began.

Colonel Meintz, the Minister of Defence, issued a statement to the Press as soon as peace was restored, laying emphasis on the great part which the South African Air Force had played

in the suppression of the attempted Revolution. One phrase of Colonel Meintz's is particularly worthy of note. It reads as follows:—

"Not only was the offensive power and the moral effect of its employment after the declaration of Martial Law most efficacious, but in the trying and anxious period prior to March 10th the hands of the Government were strengthened by the knowledge that in this arm they held practically a trump card. They were, therefore, enabled calmly to exercise practically unprecedented patience without jeopardising the public security to any great extent."

### A Warning.

On the whole, therefore, it may be taken that the little South African Air Force has thoroughly justified its existence, and may hope for better support from the Government in future. It seems all the more necessary, therefore, in the interests of the South African Air Force itself, to remove one lamenable misapprehension under which the South African Government seems to be labouring. The Cape Dutchman, though ever hospitable and willing to help a friend in distress, is notably close in money matters, and this characteristic possibly account for the attitude of mind against which one issues the following warning.

It has been stated in South African papers that experts who have inspected aircraft in possession of the South African Air Force have expressed the opinion that the timber in the machines is in fact in better condition than it was when it was imported to South Africa. The argument is that the machines have been carefully stored and that the timber is now better seasoned than it was. The *Pretoria News*, in an account by one of its representatives of a visit to the S.A.A.F. aerodrome at Roberts Heights, Pretoria, says: "It is interesting to notice that South Africa is the only Dominion which has preserved its gift of machines and equipment from the Imperial Government for military purposes. In the other Dominions numbers of machines were passed on to private aviation companies. It is apparent that the value of the gift was realised by South Africa. The machines were not assembled till the woodwork, etc., had become properly acclimatised. Experts say that they are now in better condition than when they left England."

As a matter of fact, this is an entirely erroneous idea, and one which all who have friends or relations in the South African Air Force should do their best to combat. All the machines presented to the S.A.A.F. are machines of War-time construction. All machines built during the last year or so of the War were built of War-emergency material on the supposition that they would last just long enough to fulfil their purpose in the War. But it was not supposed that they would be kept for use years and years afterwards.

Long before the end of the War the supply of first-class spruce and other timber suitable for aeroplanes had been exhausted. The Aircraft Inspection Department in desperation had to pass timber of qualities which it would never have thought of using in the early part of the War or in time of peace. This was not only true of timber, but it was true of practically all other materials, metal, fabric and everything else. Therefore there is no doubt that machines which were delivered haphazard abroad soon after the War are in very many cases dangerous to fly.

### A Difference.

Foreign nations or private customers buying War-time machines to-day, either from the original manufacturers or from the Aircraft Disposal Company, are in a different position. Before the machines are sent out they are all carefully overhauled and inspected, and any parts which show deterioration are scrapped and replaced by new parts. Such precautions as these naturally could not be taken by the Royal Air Force when shipping off hundreds of machines as gifts to the various British Dominions overseas.

The supposition at that time apparently was that the Governments of the various Dominions would place these machines at the disposal of aviators of those Dominions just by way of keeping them in training till newer and better machines could be supplied. It was naturally assumed that the machines would be worn out or broken up in a comparatively short time. Nobody imagined that those old machines made of War-

emergency material would be kept in store and only brought out for use four or five years after they were built.

### A Hope.

It is to be hoped, therefore, that the South African Government has among the personnel of the South African Air Force a sufficient number of very highly technical officers or men who can go over these antiquated machines in the most minute detail and make quite sure that none of them are as unsafe as a good many people believe them to be, and as some of the contemporary machines still in use by our starved Royal Air Force have proved themselves to be. It would be a thousand pities if officers and men of the South African Air Force should be killed through flying unsafe machines just when the success of the S.A.A.F. in the Rebellion has roused the people and Government of South Africa into something like enthusiasm for aviation.

A few fatal accidents now would undoubtedly cause a relapse in that enthusiasm, and if such accidents should occur one would appeal to the various South African papers which have tried so hard and have done so much to stir up enthusiasm in aviation in South Africa, notably the *Johannesburg Star* and the Bloemfontein *Motor Weekly*, to emphasise the fact in the strongest possible way that all machines built during the War are now obsolete and were originally built of emergency material.

### Our Own Plight.

We in this country, in our poverty-stricken condition, are daily risking the lives of the officers and men of the Royal Air Force by compelling them to fly overhauled war machines which are euphemistically called "re-conditioned." If our Government believed in aviation as firmly as does the French Government the Royal Air Force would have been re-equipped from beginning to end during this year. As it is the neces-

sity for paying some of our debts to the International Financier makes it necessary for us to carry on with obsolete machines and let our aviators take the chance of paying the price.

France, more independent of the International Financier, prefers not to pay her debts but to have a large and safely mounted Air Force. South Africa, so far as her Air Force is concerned, has hitherto gone even one better than France and has been equipped by the charity of the Mother Country. It is therefore the more argently to be hoped that very soon the South African Government, now converted in such a practical manner to a belief in aviation, will see that it is worth while to equip her little Air Force with modern machines which are safe to fly.

### Congratulations.

Meantime the officers and men of the S.A.A.F. deserve very sincere congratulations on the splendid work they have done. It is only a few weeks ago since this paper published a picture of certain men of the S.A.A.F. and one of their charity S.E.sas on an orchestra, at some kind of charitable entertainment. Up to that date that was apparently the only public service performed by the S.A.A.F. One published the photograph deliberately in the hopes that some of the personnel of the S.A.A.F. might use it on some of their Government people as evidence of what an Air Force ought not to be doing.

Almost simultaneously with the appearance of that photograph the S.A.A.F. went into action with all that gallantry and disregard of self which won the South African aviators in the Air Force during the War the reputation of being among the best fighting men in the British Empire. None will doubt that the South African aviators of the future will uphold the reputation which they have already won in war, both in Europe and in their own country.—C. G. G.

## THE FUTURE OF CIVIL AVIATION.

When this paper recorded last week that Sir Sefton Branceker had been appointed to control Civil Aviation the official announcement had not been made, and consequently one was not aware that General Branceker is to be known officially in future as Director of Civil Aviation, the magnificent title of Controller General of Civil Aviation having been abolished. Precisely what difference in effect the change in title will have one does not know, and it is unlikely that it matters, beyond the fact that hitherto there has been too much control and that a little energetic direction will be a very good thing. What does matter is that we now have a Director of Civil Aviation who is not only a firm believer in the future of commercial flying and a man of considerable foresight, but one who has proved himself capable of handling men and of coming rapidly to a decision on any point which comes before him.

Since General Branceker left Aircraft Transport and Travel Limited he has given a great deal of his time to and has done a great deal of hard work for the Air League of the British Empire, a body which at one time promised to do for the Air Force what the Navy League did for the Navy. Unfortunately just when the Air League might have been of the very greatest use at the end of the War, when people were interested in and enthusiastic for aviation, the League fell into a state of innocuous desuetude. It was not that the Air League ever did anything that it should not have done, in fact so far as one could discover at the time it never did anything at all. The Air League has always been eminently respectable, and it has always meant well. But it has always lacked a man or men of energy and driving power to force it into the position which it ought to occupy. Unlike the Navy League it never had a Robert Verburgh to finance it and to direct its councils, and it never had a Pat Hammon to impress on the World the decisions of its Council.

The possibilities of the Air League have only begun to appear during the last twelve months during which General Branceker has been devoting part of his time to it. He has held meetings of the Air League in the most important centres of Great Britain, and as a result the membership of the League now reaches nearly as many thousands as it numbered hundreds when he began to take an interest in it. Naturally in his new position General Branceker can only in future regard the Air League with a benevolent official eye, and, consequently, he has written to the Secretary of the League the following letter, which one gathers will be published in the next of the League's monthly bulletins.

"It is with great regret that I write to tell you that my active participation in the work of the Air League must cease. I have accepted the offer to become Director of Civil Aviation in the Air Ministry, the new appointment which is being established as indicated by the Secretary of State for Air in his Budget Speech.

"It may surprise some of our members that I can accept service with a Government whose aviation policy I have

frankly and continuously criticised during the last three years. But as a matter of fact, this policy has lately been veering round into the right direction. The Air Ministry is now firmly established as a separate Department of State, instead of being attached to the War Office as it was in 1920. The Royal Air Force has weathered the storm of intrigue and opposition brought to bear on it from various quarters, and now stands firmly on terms of equality with the other Services, and is rapidly making friends with them. The Government has recognised the necessity of direct financial assistance to the cross-Channel air services, and is at length taking active steps to investigate the details of an air service between England and Australia. It is also seriously considering an offer to participate in a large airship transport scheme.

"Finally, the post of C.G.C.A. has been abolished, and the establishment of the Civil Aviation Department is being reduced to reasonable limits. It is clear, however, that much more must be done, and this, I believe, is now realised by Government.

"All these facts lead me to believe that I am justified in relinquishing the role of critic for one of active assistance, particularly as I am accepting a position the status and remuneration of which has been cut down, as suggested in some of my criticisms.

"Meanwhile let the members of the Air League remember that the Government can only justify expenditure of any sort to-day when supported by a strong body of public opinion, and that it is for them to increase the number of Britons who realise that the whole future safety of this country lies in our power in the air.

"The Air League, by educating public opinion, can be an enormous assistance to an Air Ministry which, although its members may have a firm belief in aviation, cannot obtain the money required for proper progress unless the importance of aviation is realised by all the members of the House of Commons and by the public at large."

With these sentiments one agrees cordially, and one can only hope that the Air League will make a great effort to work along the lines indicated by General Branceker. It is perhaps too much to hope that any rich man will devote his time and money to the work of the League as did the late ever-to-be-regretted Robert Verburgh to the Navy League, but it is possible that a certain number of men of ability and influence such as some of the brilliant young Members of Parliament who have served in the Air Force will at any rate help the League by speaking on its behalf as often as possible.

Now that the Royal Air Force is officially the First Line of Defence of the British Empire the Air League has a very much better reason for its existence and very much stronger arguments than it has ever had in the past. Therefore one wishes it all the success which the greatness of its task requires.—C. G. G.



## SIR WALTER RALEIGH.

Those who are concerned with aviation have by the death of Sir Walter Raleigh suffered a greater loss than the majority of them realise. Sir Walter was invited by the Air Ministry, soon after the Armistice, to compile and edit an official history of the Flying Services. The first volume of the History is now, one believes, practically ready for publication, and as one has been privileged from time to time to see parts of this volume in proof, one can vouch for the fact that no better history could have been written. Those who read the first volume of the History as produced by Sir Walter Raleigh will ever lament that he was not spared to finish the great work which he began with such enthusiasm.

Sir Walter Raleigh was born in 1861, the son of a Scottish Congregational Minister, and took his degree at Cambridge. Thereafter he went to India as a professor of English Literature, and later taught at Manchester and Liverpool. In 1900 he was appointed to the chair of English at Glasgow, and in 1904 was promoted to a similar post at Oxford.

Though nominally a Scot, Sir Walter was the highest type of educated English gentleman. All his published works deal with English Literature. It was probably the finest judge of literary style of the present day and, as was only fitting under the circumstances, his own style had a beauty and charm which is all too rare in these days of hushed history.

In its well-informed obituary on Sir Walter Raleigh, the "Times" says: "Life to him was joyous adventure, and in the enthusiastic pursuit of this he died." His death was in fact due to his pursuit of the history of the R.A.F.

He left for Egypt in March last, and flew to Baghdad by the Desert Route, where one of the machines of his party broke down and a halt was made in the Desert under bad weather conditions. On arriving at Baghdad he fell ill but flew on to Mosul, fever setting in on the way. He was treated there and advised to await recovery, but insisted on returning immediately to Baghdad and Egypt.

## CIVIL AVIATION CHANGES.

Wing/Comdr. W. D. Beatty and Lieut.-Col. W. O. Raikes, Deputy Controllers of Information and Planning (Home and Overseas respectively) in the Department of the Controller-General of Civil Aviation, have tendered their resignations.

No reason is given as to the reasons for these resignations. They may be caused by the Geddes' Axe or they may be due to incompatibility of temper as between themselves and the new Director of Civil Aviation.

It was generally thought when Sir Frederick Sykes resigned that Wing-Comdr. Beatty would become the new Chief of Civil Aviation. He had a very distinguished career in the R.F.C. and the R.A.F. during the War, and showed remarkable ability both as a commander in the field and as an administrator at home. After the war he did remarkably good work in developing Civil Aviation, and himself demonstrated his faith by several big flights, notably to Madrid and back. He learned to fly an Avro in 1911 and has flown regularly ever since. Personally he has the knack of inspiring trust and liking in all who meet him, and it is greatly to be hoped that his resignation does not mean his leaving the official side of aviation.—C. G. G.

## THE HANDLEY PAGE CEREMONY.

On Tuesday last, May 16th, Major-Gen. Sir Sefton Branker made his first official appearance in public when he went to Croydon to christen the two new Handley Page twin Rolls-Royce engine biplanes for the H.P. Transport Service to Paris.

The machines were christened respectively Princess Mary and Prince George. After the ceremony Sir Sefton made a brief speech of benediction. He said that he wished to congratulate the oldest of our air transport lines on its latest departure.

He himself would in future cease to be a critic and welcomed the prospect of being criticised. He thought that his department ought to be more criticised than any other. Much more outside pressure was needed to make statesmen see the value of air transport and spend money to assure proper progress.

He said that he had no policy except that which he had preached when out of office. He had got to learn his job. This year's policy was already settled by the Government and could not be upset. We had to work for a new policy next year.

As regards the Handley Page firm he confessed himself one of those purists who thought that transport should be

On returning to England he had a prolonged attack of fever which was ultimately diagnosed as typhoid. Peritonitis followed, and he died in the early morning of Saturday last. How a man of his frail constitution managed to live until then through an attack of fever which must have begun some time early last month is wonderful. One can only assume that his indomitable will carried him through where a weaker man would have resigned himself to his fate.

Unless the first volume of the History has been altered considerably since one saw it in proof, many examples will be found of the quietly subtle humour which was Sir Walter's peculiar quality. Not only had he a keen sense of humour but he was always ready to tell stories more or less against himself.

There was, for example, the story of his visit to America. On approaching New York the boat was boarded by the usual crowd of prying Press-men in search of this curious person who was called Sir Walter Raleigh. All they knew of him was that he was very tall and very thin. When they arrived on deck there happened to be a very long and very thin Yankee among the passengers. At once the Press men flocked round him and demanded to know whether he was Sir Walter Raleigh. To them the Yankee replied "No, I'm not. I guess you'll find him in the saloon drinking cocktails with Queen Elizabeth."

All who knew Sir Walter loved him for his quaint Old-World courtesy which seemed to carry with it the atmosphere of the period of his earlier namesake, and suggested irresistibly that he must have been a descendant of the great Elizabethan, a suggestion which was confirmed by his curiously ill-assorted affections for literature and history and adventure.

One can only hope that the Air Ministry will have the good fortune to find somebody who will continue in future volumes of the History of the Flying Services the high standard which has been set by Sir Walter Raleigh in the first volume.—C. G. G.

dissociated from manufacture. Mr. Handley Page was the most outstanding personality in connection with civil aviation and though he had received many blows he always came up smiling. He hoped that the H.P. venture might prove the exception to the rule of dissociation from manufacture, and he (General Branker) hoped that he (Mr. Handley Page) would be of considerable assistance to him in making a success of Civil Aviation.

Mr. Handley Page said he felt as if he were addressing a Salvation Army meeting, and though he did not intend to lead them in praise and prayer, he thought they should praise General Branker for his past and pray for his future.

Thereafter there was an interval for refreshments and later much flying by the two new machines, one of them lifting easily with twenty-five passengers on board.

Certainly these new W.8s strike one as being one of the nicest types of passenger carriers that one has seen. But one hopes ere long to see new H.P. passenger machines with slotted wings and all that they entail.—C. G. G.

## THE AIRSHIP SCHEME.

As reported in last week's issue of this paper the airship scheme promoted by Commander Burney is now receiving the attention of the Treasury. In the meantime the Air Ministry have made the following communication to the promoters:—

"The Air Council have had under further consideration your latest proposals for the establishment of a commercial line of airships to India and to Australia, and I am directed to inform you that, in the opinion of the Air Council, the scheme as now put forward by you constitutes a notable advance upon any other scheme for the utilisation of airships in connection with Imperial communications which has previously been submitted to the Air Council."

"They further consider that, with certain additions given below, that scheme offers a reasonable prospect of being able to operate ships satisfactorily between India and this country, subject to definite recognition of the fact that any undertaking involving the regular use of airships as a means of communication must necessarily be of a highly speculative nature, especially from the commercial point of view."

"(1) The number of airships to be provided to be increased from five to six;

"(2) An airship base, complete with airship shed, and the necessary plant, to be erected in India."

"The Air Council are at this stage unable to make any statement regarding the financial aspect of the scheme."



## R.A.F. INTELLIGENCE.

## R.A.F. Appointments.

Wing Cmdrs. H. S. Turner, M.B.E., D.T. M., from No. 1 School of T.T. (Boys), Halton, to H.Q. R.A.F., as P.M.O.; 25/4; J. MacGregor, M.C., M.D., to No. 1 School of T.T. (Boys) Halton, as P.M.O. in charge, R.A.F. Hospital, Halton, 25/4; A. V. Bettington, C.M.G., from R.A.F. Depot to Halway, 1/5.

S/Ldcs. W. B. Cushion, from Care and Maintenance Party, Donibristle, to H.Q. (C.A.), 10/5; A. J. Currie, from H.Q. (M.E.), to command No. 1 Armoured Car Company (M.E.), 7/4; M. B. G. Copman, from H.Q. (M.E.), to command No. 2 Armoured Car Company (M.E.), 7/4; V. O. Rees, O.B.E., from Aircraft Park (Iraq) to R.A.F. Depot, Supernumerary (non-effective), 31/5; P. Babington, M.C., A.F.C., from R.A.F. Depot to Air Ministry (Director of Personnel), 1/4; A. J. Milley, O.B.E., from Air Ministry (Director General of Supply and Research), to Aircraft Depot, Egypt, 20/4; O. T. Boyd, O.B.E., M.C., A.F.C., from R.A.F. Depot to Air Ministry (Director of Operations and Intelligence), to R.A.F. Depot (Supernumerary), 15/5; A. Corbett-Wilson, from No. 1 F.T.S. to H.Q. M.E., Supernumerary, 20/4; R. S. Maxwell, M.C., D.F.C., from R.A.F. Depot to Air Ministry (Directorate of Operations and Intelligence), 15/5; R. L. G. Marix, D.S.O., from M.T. Repair Depot to R.A.F. Depot, Supernumerary, (non-effective), 11/4; K. S. Overton, from R.A.F. Depot to I.A.A.D., as S.M.O., 10/5; A. J. O. Wigmore, M.B., from Palestine Group, H.Q., to Palestine Wing H.Q., as S.M.O., 1/4.

F/Lts. R. E. H. Daniel, from R.A.F. Depot to No. 1 Armoured Car Company (M.E.), 20/4; M. B. Ward, from School of T.T. (Men) to Aircraft Depot, Egypt, 20/4; J. K. Waugh, D.S.C., from Inst. Design Est. to Seaplane Training School, 10/5; T. P. Y. Moore, from No. 216 Sqdn. to No. 2 Armoured Car Company (M.E.), 7/4; R. M. King, from No. 207 Sqdn. to R.A.F. Depot, 8/5.

The following F/Lts. to R.A.F. Depot (Supernumerary):—A. C. Randall, D.F.C., from R.A.F. Base, Leuchars (203 Sqdn.), 3/4; E. C. W. Fitzherbert from Aircraft Park (Iraq), 31/5; J. W. B. Grigson, D.S.O., D.F.C., from No. 35 Sqdn. (Iraq), 31/5; C. H. Faurey, M.B.E., from H.Q. R.A.F. Iraq, 31/5; P. H. Cummings, D.F.C., from No. 5 Sqdn. (India), 6/4; G. C. Gardiner, D.F.C., from No. 84 Sqdn. (Iraq), 31/5; H. L. Hamner, D.F.C., from H.Q. R.A.F. 5/5, 1/5.

Air Cmdre. E. A. D. Masterman, C.M.G., O.B.E., A.F.C., from Inter-Allied Aeronautical Commission of Control (Germany), to H.Q. (C.A.), Supernumerary, on disembarkment of I.A.A.C. of Control (Germany), 8/5. Wing Cmdr. F. E. T. Hewlett, D.S.O., O.B.E., to H.Q. (C.A.), on completion of Special duty with Admiralty, 20/5.

S/Ldcs. R. B. Maycock, O.B.E., from 210 Sqdn. to Marine and Armament Exp. Estab., 4/5; L. E. Forbes, M.C., from R.A.F. Depot to command No. 2 Sqdn., 15/5; A. J. Butler, M.C., A.F.C., from No. 2 Sqdn. to R.A.F. Depot, Supernumerary, 26/5; R. E. Bell, M.B., from H.Q. R.A.F. Ireland, to R.A.F. Depot, Supernumerary, 5/5.

F/Lts. G. E. Lavock, D.F.C., from No. 230 Sqdn. to Marine Armament Exp. Estab., 1/5; J. S. Goggin, from R.A.F. Base, Leuchars, to H.Q. (C.A.), 18/5; T. H. K. MacLaughlin, from 39 Sqdn. to No. 2 Sqdn., 17/5; G. H. H. Maxwell, M.B., from I.A.A.D., to 39 Sqdn., 15/5; A. Williams, from I.A.A.D., to No. 2 F.T.S., 15/5; O. Armer, from R.A.F. Depot to No. 5 F.T.S., 15/5; C. Fox-Pitt, from R.A.F. Depot to Armament and Gunnery School, 8/5; N. S. Douglas, from No. 36 Sqdn. (M.E.) to No. 216 Sqdn. (M.E.), 1/5; J. H. D'Almeida, D.S.O., from No. 47 Sqdn. (M.E.) to R.A.F. Trans-Jordania H.Q., 1/4; W. H. L. O'Neill, M.C., from R.A.F. Depot to R.A.F. Base, Leuchars, 15/5; J. M. Burke, from R.A.F. Depot, to Marine Armament Exp. Est., 15/5; H. C. Irwin, A.F.C., from R.A.F. Base, Leuchars, to Air Ministry (Director of Operations and Intelligence), 15/5; R. H. Smyth, M.C., from No. 37 Sqdn. (India), to R.A.F. Depot, Supernumerary, 15/4; C. McCollum Jones, M.A., from R.A.F. Central Hospital to Central Medical Board, 22/5; O. St. Ieger Champion, from No. 2 Sqdn. to R.A.F. Central Hospital, 10/5.

## The Gordon Shephard Memorial Prize.

The Air Ministry announces that the awards in the 1921 competition for the Gordon Shephard Memorial Prize essay, the subject of which was "The probable influence of air reconnaissance on strategy and tactics," are:—1st prize £100; 2nd prize £50; 3rd prize £25. The Competition, which is open to all R.A.F. officers,

N.C.Os. and men, was established as a memorial to the late Brigadier-General G. S. Shephard, D.S.O., M.C., R.A.F.

## Independent Force R.A.F. Reunion.

The fourth annual reunion dinner of the Independent Force, will be held at the Hotel Cecil at 8 p.m. on Monday, 10th June. Sir H. M. Trenchard, Chief of the Air Staff, who commanded the Independent Force in France, will preside.

Among those who have already notified their intention of being present are the Duke of York and General de Castelnau, who commanded the French Army of the East from whose area the Independent Force operated.

Tickets, 15s. each, can be obtained from the Hon. Sec., Independent Air Force Dinner, Room A337B, Air Ministry, W.C.2.

## Dunkerque Officers' Dinner.

The Fourth Annual Dinner for Officers who served in the Dunkerque Command of the P.N.A.S. and the R.A.F. from 1914 to the Armistice will be held at the Hotel Cecil on June 28th, 1922, at 7.30 p.m. on 8 p.m.

The Chair will be taken by Lieut.-Col. F. K. McCleum, A.F.C.

The Tickets are £1 each, which sum should be forwarded with the application.

Those who wish to be present should apply not later than June 21st to Treasurer, Dunkerque Dinner, Royal Aero Club, 3 Clifford Street, W.1.

## R.A.F. SPORTS AND PASTIMES.

## Henlow Notes.

At the Spring Sports Meeting, which was held in miserable weather, the A.R.S. won the Wise Challenge Cup, E.R.S. and Headquarters next. Results of the principal events were as follows:—

Half Mile.—1 Smith; 2 Nicod; 3 Ellis.  
Mile Relay.—E.R.S. won (Smith, MacKenzie, Scarle and Robinson).

Half Mile Relay.—A.R.S. won (Downs, Vanner, Ford and Hall).

100 Yards.—1 Downs; 2 Ford; 3 Sutcliffe. 11 secs.  
Shot.—H.Q. won (F/Lt. Maxwell, F/Sjt. Barber, Cpl. Murtagh and Cleave).

Mile.—1 White; 2 Nicod; 3 MacKenzie. 5 mins.  
Quarter Mile Relay.—A.R.S. won (Downs, Mihner, Ford and Vanner).

High Jump.—A.R.S. won (Full, Rochford, Vanner and Downs).

Long jump.—A.R.S. won (same team).  
Three Miles.—1 Covey; 2 Cox; 3 Ellis. 16 mins. 37 secs.  
Officers 220.—1 F/Lt. Maxwell; 2 F/Lt. Anne; 3 Wing/Cmdr. Heiden.

The prizes were presented to the winners by Mrs. U. J. D. Bourke.

Our Soccer team has won top honours and a positively

(Continued on page 358)



R.A.F. CHAMPIONSHIPS AT BAGHDAD. (1) The start of the 100 yards. (2) AC. Brown (Aircraft Park) putting the weight. (3) Lady Cox presenting the Championship Cup to No. 6 Squadron. (4) F/O Pruden (No. 6 Sqdn.) winning the 440 yards.

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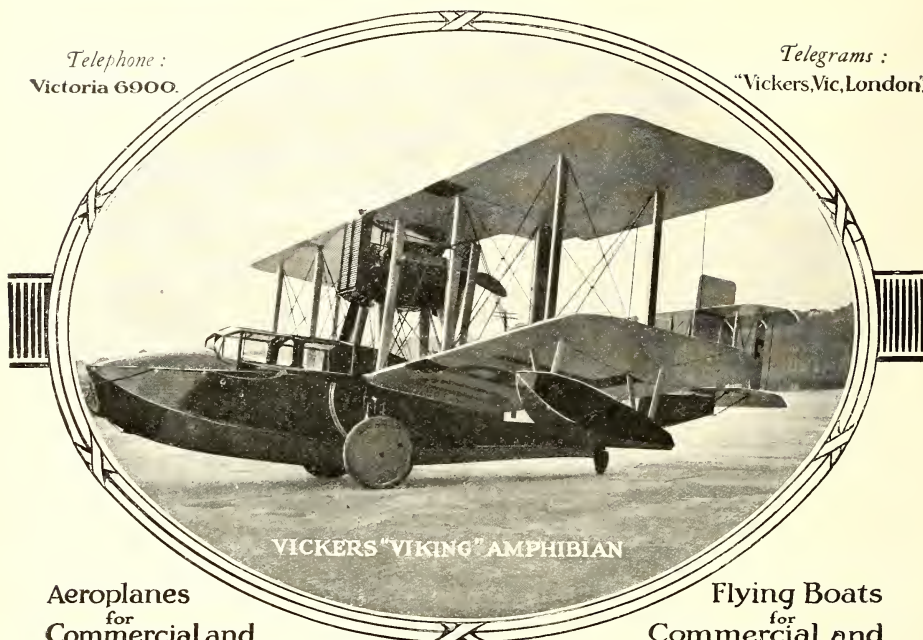
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ferentes tipos de alas, chassis y  
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The Vickers "Viking" was classified FIRST in the following competitions at the INTERNATIONAL SEAPLANE COMPETITIONS at ANTWERP, July, 1920.

1. Shortest time in "unsticking" from water.
2. Fastest time over a given circuit.
3. Climb to 1,000 metres.
4. Altitude with full load



Depots

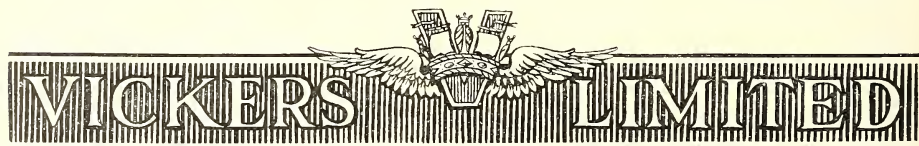
MANCHESTER: Millgate Buildings,  
Long Millgate.  
BIRMINGHAM: Vickers House,  
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NEWCASTLE: Commercial Union  
Buildings, Pilgrim Street.  
GLASGOW: Vickers House, 247,  
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Brief Specification:

Viking Mark IV

6 Passengers and  
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lbs Freight.  
RANGE 340 miles.  
SPAN: 50' 0"  
HEIGHT: 15' 3"  
LENGTH: 35' 0"

The Vickers "Viking" was the winner of the FIRST prize of £10,000 for the Amphibian Class of Aircraft entered for the BRITISH AIR MINISTRY COMPETITION, September, 1920.



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# AERONAUTICAL ENGINEERING

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INCORPORATING AIRCRAFT ENGINEERING AERODYNAMICS, AIRCRAFT FINANCE AND COMMERCIAL AERONAUTICS AND MATTERS PERTAINING TO THE AERONAUTICAL ENGINEER AND THE AIRCRAFT TRADER.

### THE WEEKLY COMMENTARY.

In a note below certain points concerning the connection between landing speed, and the safety and regularity of commercial air transport, which have often been overlooked are discussed.

The subject is one which will remain of very great importance until the aero engine becomes considerably more immune from breakdown than any yet known form of motive power.

A new oleo-pneumatic undercarriage which has been developed by A. V. Roe and Co. is described in this

issue. This undercarriage should be of great value in reducing the risk of landing in bad grounds, and also should be of value for early training and night-flying purposes.

The Silvertown crash-proof tank, which was awarded first prize in the Air Ministry Competition, is described and illustrated. The extreme simplicity of the tank, combined with its proved efficacy, should secure that it shall speedily come into general use.

### LANDING SPEEDS AND SAFETY.

The discussion of Capt. de Havilland's recent paper on the "Design of a Commercial Aeroplane" revealed the fact that there still exists in this country two schools of thought on the subject of landing speed.

One school, of which Capt. de Havilland is the most successful practitioner, holds that there is no danger in high landing speeds provided the run after touching can be kept within safe limits. This school points to the absence of serious accident with certain well-known heavily loaded types which have a short "pull-up," as evidence that their contention is justified, and urge that as heavy loading is necessary to a high commercial efficiency it is necessary to accept the high landing speed which is its nearly inevitable concomitant, for so long as the necessary quick pull-up is achieved.

The other school refuses to accept the evidence in favour of the safety of such landing speeds as are defended by the first. The case on their side has not so far been very clearly put, though Major Mayo touched upon its essentials in the discussion of Capt. de Havilland's paper, and it seems worth while to expound the question a little more clearly. Capt. de Havilland puts forward a figure of 160 yards as representing a safe "pull-up" distance. Let that figure be accepted for the purpose of argument. Thus any machine which will pull-up in 160 yards is safe, provided always that one can guarantee to give it 100 yards for the purpose. Flying over a route such as the London-Paris it is probably possible to guarantee this if the weather is clear and the pilot can fly at a reasonable height. If the weather is such that visibility is poor along part of the route—and it often is—there is the possibility of having to force-land in a patch of mist or fog. If the ground visibility at the landing point is less than 60 yards, there is a possibility that the machine before stopping may hit an obstacle invisible until it is too late to avoid it.

Even if the ground visibility considerably exceeds the pull-up distance, is, say, two or three times that distance, it is still possible that an obstacle which will be reached before pulling up is possible, will not be visible until it is too late to change the landing point.

This is a very real danger. It is the cause of a very large portion of the hesitancy at present shown by pilots in flying on days when the problems either of finding the way or of landing at terminal aerodromes is of no importance.

If two aeroplanes of different landing speeds have the same "pull-up," it is reasonably accurate to assume that the speed of each, at any given distance from the first point of contact, will be in proportion to that machine's landing speed. If machine A lands twice as fast as machine B, both pull-up in 160, and both hit an unforeseen obstacle say 50 yards from touching the earth, A will hit that obstacle when travelling twice as fast as B. The impact varies as the square of the speed, and the damage to A and to its contents should be four times as great as the damage to B.

Moreover A will hit the obstacle after precisely one half the time from its becoming visible, and has thus a less chance of acting to minimise the danger.

It will be seen therefore that the risks of damage due to having to force-land in conditions of poor visibility are at least as the square of landing speed—pull-up being equal.

Bad visibility is one of the greatest hindrances to the regular operation of air transport services. High landing speeds increase the dangers of bad visibility, and lead to the abandonment of trips under conditions which could reasonably be faced were these speeds considerably reduced. The fact that crashes have not occurred so far with the type of machine advocated by Capt. de Havilland merely means that pilots will not fly those machines when conditions are sufficiently bad to make a forced landing really dangerous.

Apart altogether from the poor visibility conditions, it is usually unsafe on fast landing machines to glide at anything like their minimum speed, and therefore they must be brought down at a fine angle, and cannot get into fields surrounded by obstacles which could be used by lower speed machines. This effect is exaggerated in practice because the effect of any head wind is reduced in proportion to their high landing speed.

And, if they do succeed in landing in such a field, it may be impossible for them to get out of it again, for high landing speed means high getting-off speed, and therefore, a long preliminary run.

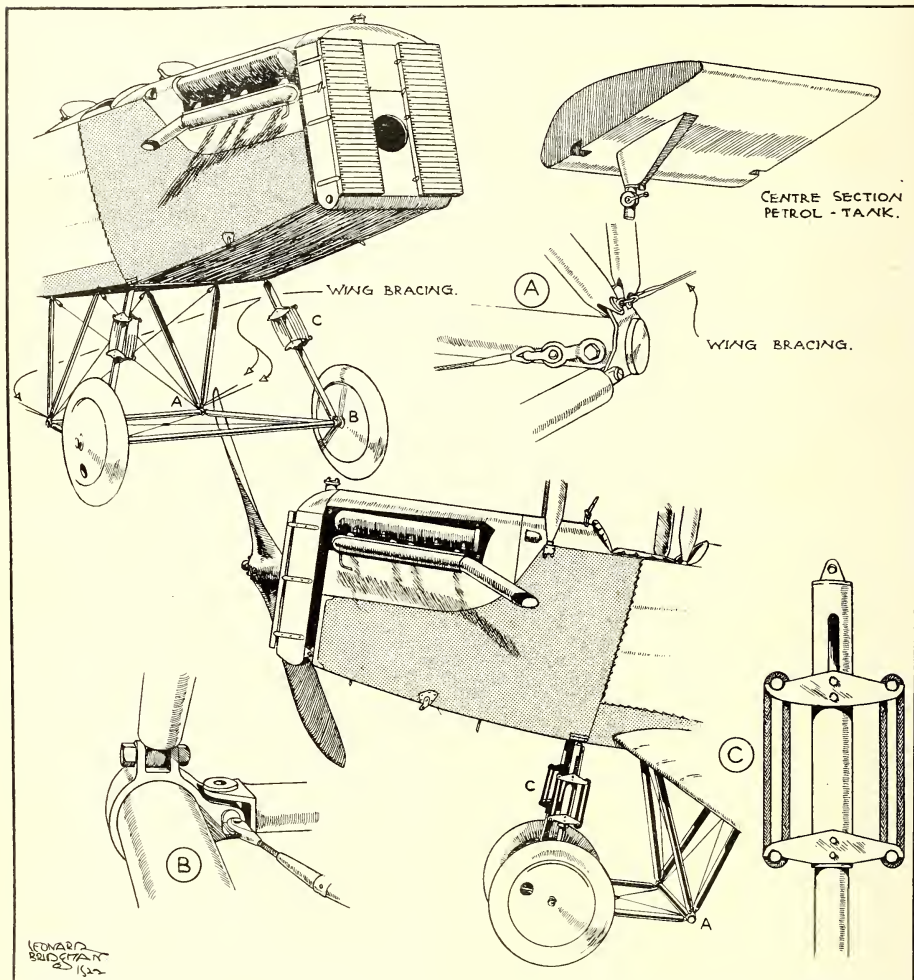
Heavy loading is essential for economical reasons, and means must be adopted to combine the two qualities, high-wing loading and low landing speed, in one and the same machine. At the present moment there are known methods which will achieve this end.

It is true that it is not possible to employ any of these methods as yet with the assurance that they represent the best solution of the problem.

It is practically certain that it will always be necessary to compromise between the desiderata of maximum efficiency and that of a reasonably safe landing speed, but it is certainly a matter to be faced by aircraft designers that until aero-engines are so reliable that the prospect of a landing other than on a prepared aerodrome is so remote as to be negligible, really low landing speeds are necessary if flying under conditions of poor visibility is to be carried on with reasonable safety.

At the worst it can only mean a reduction of 10 to 20 m.p.h. in cruising speed to bring the landing speed down to a relatively safe margin, and, unless the summer which is to come follows last summer in providing abnormally good weather conditions, it is very likely that it will be shown during that period that even at such a sacrifice a really low landing speed will justify itself under the conditions which attain on the cross-Channel route.—W. H. S.

## THE AVRO OLEO-PNEUMATIC UNDERCARRIAGE.



There is in the possession of A. V. Roe and Co. Ltd. a certain biplane, at present known as the Avro "Viper," which in its young days was of the 504K brand. At the 1921 Aerial Derby this machine made its debut fitted with a Vee-type undercarriage and an 180-h.p. Wolseley "Viper" engine in lieu of the more familiar rotary engine. Since then this machine has been flying regularly in a series of guises, firstly as a land machine with the original central-skid undercarriage, then as a very efficient seaplane, a series of which have been supplied to a certain foreign Government, and more recently it has served as a base for an experimental oleo-pneumatic landing-gear.

This gear, which has been developed by A. V. Roe and Co., consists of two main undercarriage legs which are coupled at the base to the axle, the axle again being hinged by two horizontal tubes to the bases of two steel tube Vees situated in line with the front legs. The main legs carry a shock-absorbing device which consists of a combination of oil and rubber, and it is so designed that about half the travel of the telescopic leg is taken on the oil before the rubber is picked up. The detail of the oil valve gear is "interdit," so that most of the detail that it is permissible to disclose is shown

in the accompanying sketches. The rubber shock absorber is in the form of separate rings, so that no trouble is entailed in replacing any particular broken or frayed portion.

On the ground the weight of the machine is carried by a combination of oil and rubber, and as the machine takes off the plunger sinks to its lower limit of travel. On landing the oil takes the first shock, so that by the time the rubber comes into play there is sufficient oil beneath the plunger to prevent bouncing.

Mr. Hinkler, by changing his usual faultless method of landing, has been demonstrating how this undercarriage defies even the most ham-handed of pilots, by deliberately flattening out at various heights ranging up to 20 feet from the ground and then "pancaking," and also by landing at 80 m.p.h. with very little flattening out, but it seemed that no amount of effort on his part could induce the machine to bounce. It pulls up in a remarkably short run, and owing to the wide track of the wheels (6 feet) it is possible to navigate on the ground at almost any sane speed.

From the demonstration, which one witnessed, it would seem that the Avro "Viper" so equipped, could land and get out of the smallest and roughest of fields possible without any

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trouble. As a training machine, it might tend to give newly fledged pilots too much confidence and make them careless when passing into less robust machines, but for fully trained pilots it would seem almost ideal and guard the machine against almost any type of cross-country flying accident.

One detail which has no connection whatever with the new

undercarriage is also shown in the sketch. This is the gravity petrol tank which is now standard on all 504K type Avros and derivatives therefrom.

It will be seen that the whole centre section is tank, and the tank is so built as to take the loads usually transmitted through the centre section spars.

### THE SILVERTOWN SELF-SEALING TANK.

The Silvertown Anti-fire Self-Sealing Petrol Tank with Detachable Cover, submitted by the India Rubber, Gutta Percha and Telegraph Works Co., which was awarded first prize in the Air Ministry Competition, is the result of long experience and a great amount of experimental work. Indeed, the work may be said to date back to 1877, when the Silvertown Co. were conducting experiments in connection with Col. G. V. Fosbery, who at that time took out a patent for covering the hulls of ships with india rubber for the purpose of preventing the inlet of water when perforated by a bullet. The idea was never seriously exploited, no necessity of sufficient importance having arisen previous to the late War to call for such protection.

With the use of aircraft in actual war came the terrible results of gun-fire on the fuel tanks carried by fighting machines, and the Silvertown Co., in connection with the Board of Invention and Research, and later with one of the Government Air Stations, started experimenting in order to overcome the difficulty. A very large number of experiments were carried out with numerous materials, but all pointed to the desirability of simplicity, and the final results confirmed this view.

The metal shell or tank proper consists of thin-gauge metal plate butt welded together and of such a form as to permit of a large increase of capacity before bringing any tensile stresses to bear on the metal with the result that the seams successfully withstand the stresses set up by gun-fire and in crashing. This end is achieved by dishing inwards each side of the complete tank.

The patent Detachable Cover is made of a high-grade rubber about a quarter of an inch thick, formed with an opening large enough to permit of the introduction of the shell. This opening is then closed with a closure piece of the same material suitably fastened in place, and it is claimed that this detachability renders the cover superior to any previous device. The cover can be manufactured and stored apart from the metal shell, and the latter can be removed from its cover and replaced at any time, without in any way causing damage to either.

The Judges appointed by the Air Council consider that the competition has resulted in the achievement of the objects for which it was instituted, and has produced a type of safety fuel tank which, although capable of improvement in several minor respects, is available for immediate introduction on Service and Civil aircraft, and which, for a slight increase of weight over and above that of the standard Service steel tank, gives almost complete immunity from fire, either in a crash or in action with enemy machines.

The attached photographs, which are reproduced by the courtesy of the Air Ministry, show the type of tank which was submitted to the tests at Farnborough, both in the undamaged state, and after the crash test in the final trials.

It is to be noted that even in the crashed condition these tanks failed to leak.

### AN APOLOGY.

One desires to apologise publicly both to the Proprietors of that excellent French monthly review, *L'Aéronautique*, and to purchasers of "All the World's Aircraft" for an extremely stupid mistake which one made in the list of French aeronautical publications in the newly published edition.

It is therein stated that *L'Aéronautique* is associated with another French journal with which in fact it has no connection whatever. *L'Aéronautique* is published by Gauthier-Villars & Cie., of 55, Quai des Grands-Augustins, Paris Vie, and is under the able direction of M. Henry Rouché, who may be fairly reckoned as among the pioneers of aviation.

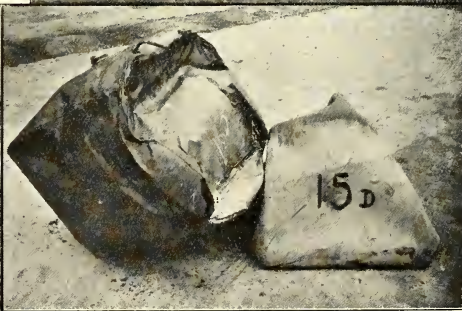
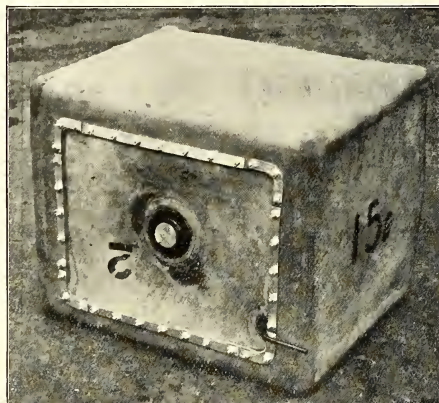
*L'Aéronautique* is at once technical and practical. It is remarkable for the sane and sensible views which it takes on all matters concerned with aviation, and one can strongly recommend it to the attention of all readers of *THE AEROPLANE* who are interested in the construction and operation of aircraft. The annual subscription is 50 francs, and Messrs. Gauthier-Villars will, one feels sure, be pleased to send a specimen copy to anybody in this country.—C. G. G.

### THE INSTITUTION OF AERONAUTICAL ENGINEERS.

The following fixtures have been arranged:—

May 25th.—Paper by Major Hume, "The Seaplane's Place in Aviation," at the Engineers' Club, Coventry Street, W.1, at 6 p.m.

June 7th.—Visit to the Aeronautical Section of the South Kensington Museum, 3 p.m.

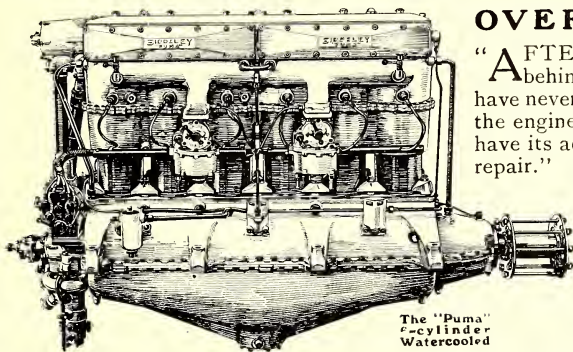


Photographs by the Royal Aircraft Establishment.]

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**THE SILVERTOWN TANK.**—Top, right, a complete tank, showing the opening in the cover for insertion of tank proper. Bottom, left, the tank in the crashed mock fuselage. Right, tank and cover after the crash.

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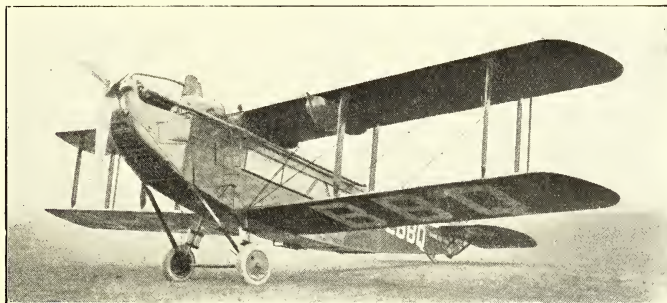
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## ITALIAN GOVERNMENT TESTS.

With the object of improvement in the commercial values of aircraft the Italian War Office through the Under-Secretaryship of Aeronautics (civil side) offers one million lire and two valuable challenge cups to be awarded in four international test-competitions.

Of these the two more important are called the Italia Cup and the Terreno Cup test respectively for land and sea planes, and are events to be competed for for three consecutive years from this year, as well as a cup which must be won twice. Each of these two events carries a 1st and 2nd prize of 750,000 and 50,000 lire respectively.

All sporting and organisation details of all four competitions are wisely left to the F.A.N.I., while the Ministry though nominating two of the judges retires to a large extent into the position of an onlooker. The Italia competition is a 2000 km. affair in a closed circuit (or circuits not less than 500 km. each) with three compulsory landings excluding the last, and of which one at least three hours after sunset or before sunrise.

No changing of engines is allowed, but different pilots may take charge, and only three relays of fuel may be taken in exclusive of that necessary for the start.

Useful load must be at least 250 kilos exclusive of the weight of one pilot, fuel, instruments, etc. Of these last every machine must be fitted with rev. counter, clock, compass, manometer, altimeter, speedometer and drift-indicator, and show in the preliminary trials a minimum speed of not more than 80 k. per hr. The War Office reserves the right to purchase any Italian machines worthy of special notice for 200,000 lire.

The above regulations refer also to the Terreno cup except that the flight is to take place over Italian territorial waters and open sea, touching at least one place on the western coast line and at least one of the two biggest islands (Sicily and Sardinia). Before the start tests of non-leakability of floats and taxiing will be imposed.

Classification of these two competitions will be arrived at by multiplying the average commercial speed attained by the useful weight carried divided by the hour consumption of fuel. In case of a dead heat the machine of which the judges shall consider the navigation instruments to be most conveniently and safely placed will get the first prize.

## A BELGIAN COMPETITION.

The Aero Club of Belgium has organised an international competition for touring aeroplanes to be held at the Brussels Aerodrome (Evere) on June 23-25, 1922. The competition is open to touring machines, single or multi-seaters, whose cylinder capacity does not exceed 7 litres.

The course over which the competition will be held is as follows: Brussels (Evere)-Gosselies—47 kiloms (landing); and Gosselies-Brussels-Gosselies-Brussels—141 kiloms (without intermediate landing).

The awards will be made for a total of 100 marks, to be allotted as follows: Thirty for general economy of engine; 30 for minimum space occupied in hangar; 25 for slow landing, 15 for quick get-off.

The prizes are as follows: The King of the Belgians' Challenge Cup to be held for one year, and the following cash prizes. First prize, 15,000 francs; 2nd prize, 7,000 francs, and 3rd prize, 3,000 francs.

The competing aircraft must be at Brussels Aerodrome before midday, June 22nd, where they will be on view to the public, and where all particulars as to price, delivery charges, etc., may be shown. A full report of the competition will be published by the Aero Club of Belgium, who will give every facility to all participants for further demonstrations in Belgium.

Entry forms and full particulars may be obtained from the Aero Club de Belgique, 73, Avenue Louise, Brussels.

## AN OLD-TIMER'S TROUBLES.

Old timers of Brooklands and Hendon will remember well the name of Capt. James V. Martin, the sporting little American seilorman who learned to fly at the Grahame-White School, at Hendon, and was one of the few pilots who flew the Grahame-White Baby Biplane of 1911. Capt. Martin married an English wife, who afterwards piloted machines of his construction in the States. Capt. and Mrs. Martin particularly distinguished themselves by flying in Alaska, their's being, one believes, the only flight inside the Arctic Circle before the War.

During the War Capt. Martin devoted himself to the design and construction of aeroplanes, and produced at the Martin Aeroplane Factory, Garden City, Long Island, New York, a number of very interesting inventions, including aerodynamic control of ailerons, a very useful system of transmission

from engines to airscrews, and a curious K-bar truss for aeroplane cellulose.

The best of his inventions, however, undoubtedly was a retractable undercarriage which allowed the landing wheels and the axle of an aeroplane to be folded right up into the fuselage. Personally one believes that a retractable undercarriage of one kind or another will be essential in the future to all fighting machines in which high speed and manoeuvrability are of vital importance. Therefore one feels that it is due to Capt. Martin to record that historically he was the originator of the retractable undercarriage.

At present Capt. Martin is engaged in a first-class row with various and sundry people in the United States, whom he accuses of having appropriated his ideas, much in the same way as numerous people in this country have been accused of appropriating other people's ideas from the invention of tanks downwards. Any of Capt. Martin's friends who would like to see an example of really elegant invective coupled with a series of charges which would make quite a good plot for a crook drama on the stage really ought to write to Capt. Martin, at Garden City, Long Island, N.Y., and ask for a copy of his pamphlet on the subject of how to steal valuable inventions.

## BRISTOLS IN THE ANTIPODES.

It has been mentioned already that the Perth-Geraldton subsidised air mail route is being run with Bristol "Towers" (240-h.p. Siddeley "Puma" engine), and it is interesting to note that in connection with the exploitation of the various aerial mail services in Australia, the Australian Controller of Civil Aviation, Col. H. Brinsmead, recently completed a tour of 9,000 miles on the Civil Aviation Department's own Bristol "Tower."

To carry out this tour of inspection by any other than the aerial route would have been practically impossible, as thousands of miles of virtually unknown country possessing nothing but Nature's hindrances to the progress of Man were flown over.

The Australian Civil Aviation Department are to be congratulated on the initiative of the Controller of Civil Aviation, as well as on the choice of the machine which they have acquired for official use.

## THE MORGAN VALVE GEAR.

The Morgan Valve Gear, which is designed to maintain constant tappet clearance despite the discrepancy introduced by cylinder expansion, was described in THE AEROPLANE of May 4th, 1921. It will be remembered that it introduces a compensating lever pivoted to the head and tied to the crank-case, upon which is mounted the ordinary rocker.

It is understood that the exclusive rights in this invention for aircraft engines have been assigned to the Bristol Aeroplane Company Ltd., and this firm is now using this gear on their "Jupiter" engine, with very good results. It maintains full power as the engine heats, and also it prevents valve and valve-spring breakage.

All inquiries for aircraft licences should be made to the Bristol Aeroplane Company Ltd. All inquiries for exclusive rights, for making under licence, in all other branches of the engineering industry should be addressed to the inventor, Mr. Raymond Morgan, 8, Clifford's Inn, London, E.C.4.

## THE AUSTIN LIFE-FLOAT.

Appropos certain remarks in THE AEROPLANE on the subject of the Austin Life Float, Mr. W. J. Austin points out that it is on the whole more convenient to use compressed oxygen for inflating his floats than compressed air. The reason is that oxygen can be procured almost anywhere in standard sized bottles whereas compressed air is difficult to get.

For this reason Mr. Austin has made the fittings of his float to suit the standard bottles sold by the British Oxygen Company, whose products can be bought almost anywhere in the world. In this way the bottles actually fitted to the float can be refilled from the standard oxygen cylinder. He says that the hundred cubic feet cylinder of oxygen only costs about 5s. and gives an ample supply for either size raft with a reserve in case of leakage.

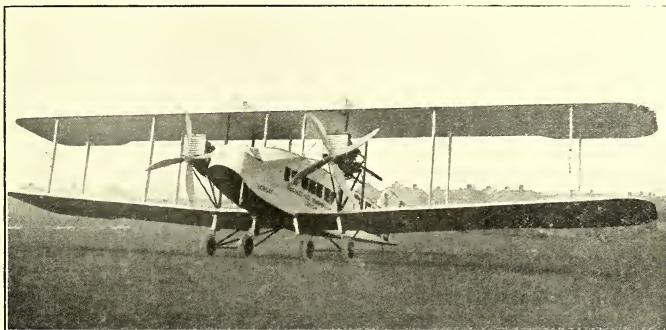
As regards the rafts themselves, Mr. Austin has recently carried out an interesting test on a float which he had prepared for the Round-the-World Flight. He inflated it about three months ago and in the three months it has only gone down to about half its full inflation. Very careful investigations showed that this minute leakage was due to one of the joints in the air bag, but even this removes any doubt there may be about the durability of the float. Incidentally, it is hoped that at an early date it may be possible to arrange a demonstration of the Austin Float in the vicinity of London.



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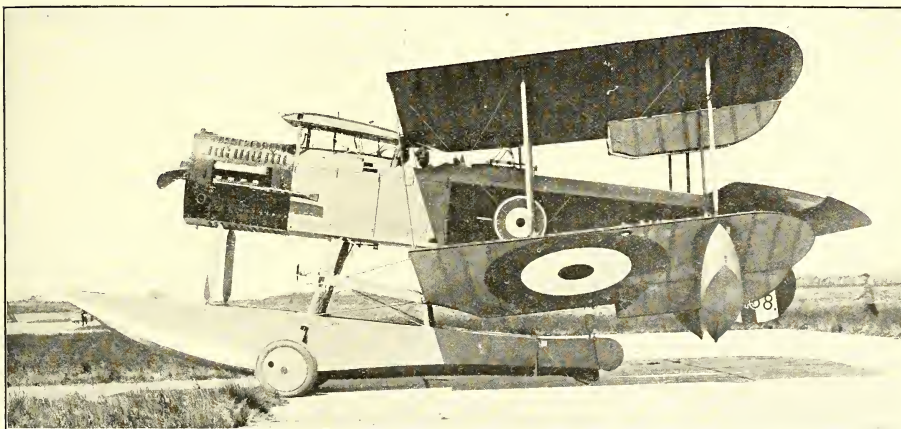
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(Continued from page 348.)

enormous challenge cup in the 1st Division of the Bedfordshire League. On May 4th the I.A.A.D., as champions, played the rest of the League at Bedford before a big gate. Our men were right at the top of their form and were leading 4-0 up to within five minutes of time when the League combination contrived to net the ball twice in succession prior to the closure being applied.

The last hockey match of the season was played at Dunstable on April 29th and, after an excellent game, we sustained our fourth defeat of the season by the odd goal in three. It has been a highly successful season and the Depot team, under the captaincy of L./AC. Macdonald, are to be congratulated on their record, which reads as follows:—Played 27, Won 18, Lost 4, Drew 5. Goals for 99, Goals against 32.

### 55 Squadron in Iraq.

It is of interest to learn that 55 Squadron, now at Mosul, Iraq, held their Squadron Dinner on March 11th, the same date on which former members of the Squadron held their Dinner in London. It is hoped that at some future date when the Squadron returns from Iraq past and present members of the Squadron will together hold a re-union dinner in London.

Former members of 55 will be glad to hear that the Squadron has had a very good year. It has done over 1,300 hours of war flying in Iraq, chiefly against marauding Kurds, and has done a large amount of bomb dropping. The Squadron's Association Football team survived to the semi-final of the Iraq Cup, a remarkably good performance for an active service squadron. The Rugby team also did well, though the game has not been largely played in Iraq hitherto.

Last summer the Squadron ran two Polo teams and owned 19 ponies, most of them up to tournament form. This year there are again two teams in the making and a better string of ponies has been acquired, consequently the Squadron hopes to do well in the Baghdad Autumn Tournament.

Altogether the Squadron is going for towards living up to the high tradition of the old 55 which won such a great reputation in the Independent Force R.A.F.

### The Air Ministry Musical and Dramatic Society

The Air Ministry Musical and Dramatic Society has arranged a series of charity performances at King George's Hall, Caroline Street, Tottenham Court Road, in order to assist the funds for re-opening the closed Wards at King's College Hospital.

"The Mikado" will be performed by permission of R. D'Oyley Carte on May 16th and 19th at 7.45 p.m., and on May 20th at 2.30 p.m.

Mr. John Galsworthy's play "The Silver Box" will be given on May 17th and 18th at 7.45 p.m.

Tickets 7s. 6d., 5s., 3s., and 2s., including Entertainment Tax, may be obtained on written application to the Hon. Sec. of the Society, Maj. J. Harland, Room 179, Admiralty House, Kingsway, W.C. and the Appeal Sec., King's College Hospital, Denmark Hill, S.E.

### "The Airman."

Further numbers of the *Airman* have been received from Manston. Every month and in every way the *Airman* gets better and better. A very interesting article by F/O F. J. Magee, dealing with the Naval Africa Expedition to Lake Tanganyika, starts in the March number, and becomes really exciting in the April number. It is to be continued. There are many further discussions of books and camp celebrities and a good record of sport. In the April issue the Editor deals adequately with an attack made on the personnel at Manston by a misinformed section of the daily Press.

## AIRCRAFT IN PARLIAMENT

On May 4th, in reply to a question by Mr. BALDWIN RAPER, the SECRETARY OF STATE for AIR said that it was not considered necessary or desirable at the present time to make any scale of life-saving equipment compulsory, the arrangements made by British firms operating the cross-Channel routes being considered satisfactory.

Mr. BALDWIN RAPER: Is the right hon. Gentleman aware that on one occasion when I was crossing from Paris to London we found it urgently necessary to examine the life-saving belts and only found one satisfactory, and that was taken by the attendant? Is it not essential that instructions should be given that life-belts should be satisfactory?

Captain GUEST: I am glad that my attention has been called to that matter.

Replying to a question by Mr. ROBERT YOUNG on May 4th, Captain GUEST said that he was aware that the Costing Section of the Aeronautical Supply Department was transferred to the Technical Costs Branch now attached to the Admiralty, and that savings amounting to £3,000 had been effected as a result of references of aero engine quotations to the Costing Section. He also said that no recent occasion had arisen for reference of such quotations to the Costing Section, but that this would be done whenever desirable.

### AIR TRANSPORT AT CROYDON.

All who are concerned with aerial transport should make a special point of being at Croydon on Friday afternoon, when the delegates of the International Conference of the Institute of Transport are visiting the Aerodrome. One gathers from the officials of the Institute that approximately 200 delegates from all parts of the World are likely to be present, and therefore it will be very much to the advantage of the British Aircraft Industry if as many as possible of those connected with British air transport visit Croydon and make themselves useful by explaining to the various experts in other methods of transport the hitherto unsubstantiated claims which are sometimes made for air transport.

It will probably be well if those who go to Croydon arm themselves with a few authentic figures concerning air transport. People who run transport concerns as a commercial undertaking, and not merely as a hobby with the help of a Government subsidy, are apt to want definite figures and not mere guesses for operating costs, mileage, goods and passengers carried and casualties per million miles.

Possibly the fear of having to provide such figures may deter some of our alleged air transport experts from attending this gathering, so if they cannot be present one does at least hope that the aircraft manufacturers will send to Croydon for demonstration purposes such aeroplanes as they believe at present to represent the last word in air transport vehicles.

### WEIGHT-LIFTING SEAPLANES.

Referring to the letter from Mr. Lankester Parker recalling the record weight-lifting performance of the trans-Atlantic biplane which he flew, a reader points out that no mention is made in Mr. Parker's letter of the speed of that machine as compared with the Fairey which flew across the South Atlantic. The writer of the said letter points out that all comparisons of weight-lifting must obviously be on a basis of speed. For example, the useful load per horse power of the original Wright biplane exceeds that of any modern machine, but as it only had a top speed of about 45 m.p.h. the Wright machine was quite useless for practical purposes. The writer points out that there is nothing to prevent any intelligent manufacturer from lifting a load of 40 lbs. per h.p. at such a speed.

It is also pointed out that in the case of the Fairey the weight was lifted off the water, which is a proposition very different from getting off the land as did Mr. Parker's machine. It is calculated that if the floats and undercarriage of the Fairey were transformed into useful load the machine would be carrying at least a further 1 lb. per h.p. of useful load.

As to Mr. Parker's reference to the airscrew used on his machine, which screw was of such pitch as to prevent the engine from reaching its full revolutions, the writer of the more recent letter remarks that the method of assisting an engine by over-loading it is so far outside his technical experience that he can offer no comment on it.

### A JUBILEE GATHERING.

On May 10th over 80 members of the Crystal Palace Old Students' Society and their friends attended the 21st Annual Dinner of the Society, which happily coincided with the 50th Anniversary of the opening of the Crystal Palace School of Engineering. Mr. R. J. Money, M.I.C.E., F.R.G.S., the President for 1922 of the C.P.O.S.S., occupied the Chair, and the guest of the evening was Major-General Sir G. Scott-Moncrieff, K.C.B., K.C.M.G., C.I.E., who, as Director of Fortifications and Works during the War, was in command of more civil engineers than had ever worked under one chief in the World's history.

Among the Old Students present were Sir Cyril Kirkpatrick, now Chief Engineer to the Port of London Authority, Mr. H. E. Stilgoe, M.I.C.E., Chief Engineer of the Metropolitan Water Board, and Mr. P. V. MacMahon, Chief Electrical Engineer to the London Electric Railways. Mr. J. W. Wilson, the present Principal of the Crystal Palace Engineering School, who was associated with his father in the founding of the School, naturally received most cordial congratulations on the School's Jubilee.

Many Old Students of the Crystal Palace served with the Flying Services during the War or were concerned with the manufacture of aircraft, and some of them are still in the R.A.F. or in the Aircraft Industry. One therefore appeals to any such who may read this paragraph to get in touch with Mr. H. C. H. Shenton, the Secretary, at 28, Victoria Street, S.W.1, and to join the C.P.O.S.S. The Society is doing excellent work in placing Old Students in good positions, and it is up to all Old Students who are to-day employed either by the Government or in commercial work to help the Society towards success.

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## AND CIVIL AERIAL TRANSPORT.

## THE UNITED KINGDOM OF GREAT BRITAIN AND IRELAND.

## CONTINENTAL ARRIVALS AND DEPARTURES.

[The following table of arrivals at and departures from the British Air Ports is compiled on the following system:—First comes the initials of the Air Line; next the type of machine; next the international number of the machine; next the ports of departure and destination; next the times of departure and arrival; next the cargo, whether goods (G) and/or mails (M); next the number of passengers; and finally the name of the pilot and number of mechanics, if any.]

ABBREVIATIONS:—A.D.—Aircraft Disposal Co. B.A.—Berkshire Aviation Co. B.C.—Bristol Aeroplane Co. C.A.—Department of Civil Aviation. D.A.—Daimler Aircraft. D.H.—De Havilland Aircraft. E.C.—Compagnie des Grands Express Aériens. H.P.—Handley Page Transport Ltd. I.L.—Instone Air Line. K.L.—Koninklijke Luchtvaart Maatschappij. L.A.—Leatherhead Aviation Services. M.A.—Messageries Aériennes. M.W.—Marconi Wireless Telegraph Co. Ltd. O.—Privately owned. P.B.—Peters Ltd. S.F.—Surrey Flying Services. S.N.—Syndicat National pour l'Etude des Transports Aériens (S.N.E.T.A.).

## The London Terminal Aerodrome, Croydon. (Telephone: Croydon 2720.)

## MAY 5th:

M.A., Spad, F-ADBI, London-Paris, 05.40-08.47, G., Nil, Perignon.  
M.A., Breguet, F-CAAW, London-Paris, 05.47-08.10, G., Nil, Shepperson.  
A.D., Martinsyde, G-EATD, London-Brussels, 06.20-08.06, G., Nil, Muir.  
A.D., DH34, G-EBBU, London-Paris, 06.52-09.05, G., Nil, Herne & 1.  
D.H., DH9, G-EAYU, London-Brussels, 06.57-11.34, Nil, 1, Barnard.  
K.L., Fokker, H-NABU, Ldn-A'dam, 06.59-12.18, G.M., Nil, Van der Hoop.  
I.L., DH34, G-EBBR, London-Paris, 10.09-12.39, M., Nil, Bradly.  
I.L., DH34, G-EBBT, London-Brussels, 10.48-15.00, Nil, 5, Barnard & 1.  
D.H., DH9, G-EABU, London-St. Ing., 10.49-13.00, Nil, 1, Cobham.  
H.P., HP, G-EATH, London-Paris, 12.17-15.10, G.M., 2, Wilcockson & 1.  
A.D., DH34, G-EBBU, London-Paris, 12.43-14.50, Nil, 1, Robertson & 1.  
M.A., Goliath, F-FAKI, London-Paris, 13.07-15.53, G., 2, Draughtin & 1.  
G.E., Goliath, F-ADDT, London-Paris, 14.10-16.49, G., Nil, Courtney.  
D.H., DH9, G-EBAW, London-Brussels, 15.33-17.25, Nil, 1, Cobham.  
M.A., Goliath, F-YHMF, Paris-London, 06.13-09.21, G.M., 4, Petite & 1.  
D.A., DH34, G-EBBU, Paris-London, 06.19-11.35, Nil, 1, Herne & 1.  
I.L., DH8, G-EAWW, Paris-London, 11.28-13.54, G., 3, Shepperson.  
H.P., DH8, G-EAWX, Paris-London, 12.05-13.48, G., 5, Carter.  
M.A., Breguet, F-CAAC, Paris-London, 12.05-13.48, G., Nil, Doucin.  
M.A., Spad, F-ACMC, Paris-London, 13.20-16.15, G.M., Nil, Briere.  
G.E., Goliath, F-GEAO, Paris-London, 13.35-17.10, G., 8, Labouchere & 1.  
D.H., DH9, G-EABU, St. Ing.-London, 12.20-15.00, Nil, 1, Cobham.  
K.L., Fokker, H-NABM, Ldn-Ldn, 10.11-12.57, G.M., Nil, Warrnar.  
I.L., DH34, G-EBBR, London-Paris, 14.58-17.48, G., 6, Bradly.  
M.A., Spad, F-ADAG, Paris-London, 15.03-17.46, G., 2, Robyn.  
D.A., DH34, G-EBBU, Paris-London, 15.03-17.46, G., 2, Robyn.  
D.H., DH9, G-EAYU, Brussels-London, 14.46-16.48, Nil, 1, Barnard.  
D.H., DH9, G-EABU, Brussels-London, 17.58-20.26, G., Nil, Cobham.  
A.D., Martinsyde, G-EATD, Brussels-London, 18.00-20.16, G., Nil, Muir.  
I.L., DH34, G-EBBT, Brussels-London, 18.09-20.48, Nil, 7, Barnard & 1.

## MAY 9th:

I.L., DH8, G-EAWW, London-Paris, 05.18-07.39, G.M., Nil, Robins.  
M.A., Spad, F-ACMC, London-Paris, 05.35-07.45, G., Nil, Briere.  
A.D., DH9, G-EAXC, London-Brussels, 06.28-08.13, G., Nil, Muir.  
D.A., DH34, G-EBBU, London-Paris, 06.38-08.35, G.M., Nil, Robinson & 1.  
K.L., Fokker, H-NABU, Ldn-A'dam, 06.50-12.34, Nil, Nil, Hofstra.  
I.L., DH34, G-EBBR, London-Paris, 10.11-12.57, G., 6, Robins.  
H.P., DH9, G-EAWH, London-Paris, 10.50-12.15, G., Nil, Dismore.  
H.P., W8, G-EBBU, London-Paris, 12.05-14.39, G.M., 3, McIntosh & 1.  
D.A., DH34, G-EBBU, London-Paris, 12.09-14.45, Nil, 1, Hincliffe.  
M.A., Breguet, F-CAAC, London-Paris, 13.05-16.05, G., 1, Doucin.  
D.H., DH9, G-EBAW, London-Brussels, 14.04-16.13, Nil, 1, Cobham.  
I.L., DH9, G-EABU, London-Paris, 14.06-16.20, G., 4, Labouchere & 1.  
M.A., Breguet, F-GEAO, London-Brussels, 14.47-16.20, Nil, 1, Courtney.  
D.A., DH34, G-EBBU, Paris-London, 06.07-11.34, Nil, Nil, Hincliffe.  
I.L., DH8, G-EAWW, London-Paris, 10.11-12.57, G., 6, Robins.  
G.E., Goliath, F-ADDT, Paris-London, 11.44-15.15, G., 1, Grasset & 1.  
H.P., HP, G-EATH, Paris-London, 12.20-15.19, G., 6, Wilcockson & 1.  
M.A., Spad, F-ACMC, Paris-London, 12.45-17.22, G., 4, Perignon.  
K.L., Fokker, H-NABU, A'dam-London, 14.25-17.42, G., Nil, Muir.  
H.P., DH9, G-EAWH, Paris-London, 15.02-17.22, Nil, 2, Dismore.  
I.L., DH34, G-EBBR, Paris-London, 14.50-17.15, G., 5, Holmes.  
D.A., DH34, G-EBBU, Paris-London, 16.15-18.39, G., Nil, Munson & 1.  
M.A., Spad, F-ACMC, Paris-London, 15.48-18.35, G., 2, Portal.  
D.H., DH9, G-EBAW, Brussels-London, 16.43-18.49, Nil, 1, Cobham.  
A.D., DH9, G-EABU, Brussels-London, 17.45-19.58, Nil, Nil, Muir.  
I.L., DH9, G-EABU, Brussels-London, 18.15-20.46, Nil, 1, Courtney.

## MAY 10th:

I.L., DH8, G-EAWW, London-Paris, 07.05-09.30, G.M., Nil, Powell.  
M.A., Spad, F-ADAE, London-Paris, 07.20-09.30, G., Nil, Robyn.  
A.D., DH9, G-EAXC, London-Brussels, 08.09-11.10, G., Nil, Muir.  
K.L., Fokker, H-NABM, Ldn-A'dam, 09.57-13.00, G.M., Nil, Warrnar.  
H.P., DH9, G-EAWH, London-Paris, 09.58-12.00, Nil, 1, Dismore.  
I.L., DH34, G-EBBU, London-Paris, 10.15-13.00, G., Nil, Muir.  
H.P., HP, G-EATH, London-Paris, 12.17-15.10, G.M., 2, Wilcockson & 1.  
M.A., Goliath, F-YHMF, London-Paris, 13.00-16.00, G., 1, Petite & 1.  
I.L., DH9, G-EABU, London-Paris, 13.10-15.45, Nil, 1, Robins.  
D.H., DH9, G-EAYU, London-Brussels, 13.20-17.06, Nil, 1, Barnard.  
G.E., Goliath, F-ADDT, London-Paris, 14.05-16.00, G., Nil, Grasset.  
M.A., Breguet, F-CAAC, Paris-London, 06.10-09.53, G., Nil, Revenue.  
I.L., DH8, G-EAWW, Paris-London, 11.20-13.48, G., Nil, Shepperson.  
G.E., Goliath, F-GEAO, Paris-London, 11.40-15.09, G., 2, Favreau & 1.  
H.P., W8, G-EBBU, Paris-London, 12.05-15.01, G., 0, McIntosh & 1.  
M.A., Goliath, F-FAKI, Paris-London, 12.15-15.53, G., Nil, Muir.  
K.L., Fokker, H-NABT, A'dam-London, 13.20-15.57, G.M., Nil, P.B.  
I.L., DH9, G-EAWH, Paris-London, 14.55-17-47, G., 1, Dismore.  
I.L., DH34, G-EBBU, Paris-London, 15.07-17.45, Nil, 2, Jones.  
A.D., DH9, G-EABU, Paris-London, 15.25-17.45, G., Nil, Muir.  
D.A., DH34, G-EBBS, Paris-London, 15.35-17.55, Nil, 3, Robertson & 1.  
D.H., DH9, G-EAYU, Brussels-London, 13.00-19.15, Nil, 1, Barnard.  
I.L., DH9, G-EABU, Brussels-London, 18.45-20.55, Nil, 1, Robins.

## MAY 11th:

I.L., DH8, G-EABU, London-Paris, 05.40-08.17, G.M., Nil, Shepperson.  
M.A., Breguet, F-ADAI, London-Paris, 05.52-07.51, G., Nil, Delage.  
A.D., DH9, G-EAXC, London-Brussels, 06.20-08.06, G., Nil, Muir.  
D.H., DH9, G-EABU, London-Ostend, 06.00-10.46, Nil, 1, Broad.  
K.L., Fokker, H-NABU, London-A'dam, 06.00-12.45, G.M., Nil, Sillins.  
H.P., DH9, G-EAWH, London-Paris, 10.05-12.25, Nil, 1, Dismore.  
I.L., DH34, G-EBBT, London-Paris, 11.40-14.20, G.M., 2, Bradly.  
H.P., W8, G-EBBU, London-Paris, 12.16-15.11, G.M., 7, McIntosh & 1.  
D.A., DH9, G-EBBU, London-Paris, 08.45-11.26, Nil, 1, Robertson.  
M.A., Goliath, F-FAKI, London-Paris, 13.07-16.39, G., Nil, Draughtin & 1.  
G.E., Goliath, F-GEAO, London-Paris, 14.00-16.45, G., Nil, Favreau & 1.  
I.L., DH8, G-EAWW, London-Paris, 14.33-17.00, G., 1, Hincliffe.  
I.L., DH8, G-EAWW, London-Paris, 16.18-30.39, G.M., Nil, Courtney.  
M.A., Spad, F-ADAE, Paris-London, 06.05-09.05, G.M., Nil, Range.  
I.L., DH8, G-EABU, Paris-London, 11.35-13.37, G., 2, Shepperson.  
D.A., DH34, G-EBBU, Paris-London, 11.39-15.45, G., Nil, Broad.  
G.E., Goliath, F-ADDS, Paris-London, 11.50-14.12, G., 7, Labouchere & 1.  
H.P., HP, G-EATH, Paris-London, 12.40-15.23, G., 3, Wilcockson & 1.  
M.A., Spad, F-ACMC, Paris-London, 16.50-19.10, G., 1, Portal.  
K.L., Fokker, H-NABM, A'dam-Ldn, 15.04-17.25, G.M., 2, Van der Hoop.  
I.L., DH9, G-EAWH, Paris-London, 15.40-17.42, Nil, 1, Dismore.  
I.L., DH34, G-EBBT, Paris-London, 16.20-18.37, G., Nil, Bradly.  
D.A., DH34, G-EBBU, Paris-London, 16.20-18.37, G., Nil, Broad.  
A.D., DH9, G-EAXC, Ostend-London, -18.58, Nil, Nil, Muir.  
D.A., DH34, G-EBBU, Paris-London, 17.18-20.26, Nil, 3, Robertson & 1.

## MAY 12th:

I.L., DH8, G-EABU, London-Paris, 05.40-08.25, G.M., Nil, Holmes.  
M.A., Spad, F-ACMB, London-Paris, 05.41-07.40, G., Nil, Perignon.  
D.A., DH34, G-EBBU, London-Paris, 08.30-10.50, Nil, 2, Robertson & 1.  
K.L., Fokker, H-NABU, Ldn-A'dam, 08.30-12.45, G.M., 2, P.B.  
H.P., DH9, G-EAWX, London-Paris, 12.23-14.45, G.M., 4, Carter.  
A.D., DH9, G-EAXC, London-St. Ing., 12.27-14.25, G., Nil, Muir.  
M.A., Goliath, F-YHMF, London-Paris, 13.00-15.45, G., 2, Coupet.  
I.L., Breguet, F-CAAC, London-Paris, 13.09-15.45, G., 1, Doucin.  
G.E., Goliath, F-ADDS, London-Paris, 14.00-17.45, G., 10, Labouchere & 1.  
I.L., DH8, G-EAWW, London-Paris, 14.20-18.15, G.M., 4, Jones.  
M.A., Spad, F-ACMC, London-Paris, 16.50-19.10, G., 1, Portal.  
M.A., Breguet, F-CAAI, Paris-London, 06.45-09.38, G.M., Nil, Doucin.  
I.L., DH8, G-EAWW, Paris-London, 09.16-11.47, G.M., Nil, Courtney.  
I.L., DH8, G-EABU, Paris-London, 11.30-13.58, G., 5, Holmes.  
G.E., Goliath, F-GEAO, Paris-London, 13.10-16.15, G., 2, Favreau & 1.  
H.P., W8, G-EBBU, Paris-London, 13.31-16.40, G., 2, McIntosh & 1.  
K.L., Fokker, H-NABU, A'dam-Ldn, 15.00-17.00, G.M., 2, Geyssendorfer.  
M.A., Goliath, F-ADAE, Paris-London, 15.40-17.20, G., 3, Le Sec & 1.  
A.D., DH9, G-EAXC, St. Ing.-London, 16.16-16.56, Nil, 1, Muir.  
D.A., DH34, G-EBBU, Paris-London, 17.28-20.08, G., 1, Hincliffe & 1.

## MAY 13th:

I.L., DH8, G-EABU, London-Paris, 05.25-07.45, G., Nil, Robins.  
M.A., Spad, F-ADAE, London-Paris, 05.44-08.04, G., Nil, Range.  
D.A., DH34, G-EBBU, London-Paris, 08.30-10.40, Nil, 1, Hincliffe.  
I.L., DH8, G-EABU, London-Paris, 09.30-11.45, G., Nil, Powell.  
K.L., Fokker, H-NABM, Ldn-A'dam, 09.57-13.00, G.M., Nil, Van der Hoop.  
D.H., DH9, G-EAYU, London-St. Ing., 10.05-11.00, Nil, Nil, Cobham.  
I.L., DH9, G-EAWH, London-Paris, 10.05-12.25, G., Nil, Sillins.  
H.P., W8, G-EBBU, London-Paris, 12.25-15.50, G.M., 2, Wilcockson & 1.  
D.A., DH34, G-EBBU, London-Paris, 12.45-15.42, Nil, 3, Robinson.  
M.A., Goliath, F-ADAE, London-Paris, 13.15-15.57, G., 2, Le Men.  
K.L., Fokker, H-NABU, Ldn-Ldn, 14.00-16.15, G.M., Nil, Sillins.  
D.A., DH34, G-EBBU, London-Paris, 14.51-16.30, Nil, Nil, Herne & 1.  
I.L., DH8, G-EABU, London-Paris, 16.48-19.10, G.M., 3, Shepperson.  
M.A., Breguet, F-CAAC, Paris-London, 06.10-09.53, G., Nil, Revenue.  
I.L., DH8, G-EAWW, Paris-London, 08.20, 10.59, G., Nil, Jones.  
D.A., DH34, G-EBBU, Paris-London, 11.14-17.47, Nil, 2, Robertson & 1.  
I.L., DH8, G-EABU, Paris-London, 11.25-14.20, Nil, 3, Robins.  
G.E., Goliath, F-ADAE, Paris-London, 12.00-15.05, G., 1, Kessier & 1.  
M.A., Goliath, F-ADCA, Paris-London, 13.30-16.58, G.M., 1, Le Men & 1.  
K.L., Fokker, H-NABM, Ldn-Ldn, 14.20-17.00, G.M., 2, P.B.  
I.L., DH9, G-EABU, Paris-London, 14.22-17.10, Nil, Nil, Sillins.  
I.L., DH9, G-EAMU, St. Ing.-London, 14.40-15.30, G., Nil, Powell.  
D.H., DH9, G-EAYU, St. Ing.-London, 14.58-15.55, Nil, 1, Cobham.  
D.A., DH34, G-EBBU, Paris-London, 15.55-18.00, G., Nil, Dismore.  
H.P., DH9, G-EAWH, Paris-London, 15.49-17.57, G., Nil, Dismore.  
M.A., Spad, F-ADAE, Paris-London, 17.07-19.52, G., 1, Robyn.  
D.A., DH34, G-EBBU, Paris-London, 17.12-19.32, G., 3, Herne & 1.

## MAY 14th:

I.L., DH9, G-EAWH, London-Paris, 10.17-12.30, G., 2, Dismore.  
D.A., DH34, G-EBBS, London-Paris, 11.01-13.23, Nil, 1, Herne & 1.  
M.A., Breguet, F-ADAE, London-Paris, 11.01-13.23, Nil, 1, Dismore.  
M.A., Goliath, F-ADCA, London-Paris, 13.07-16.00, G.M., Nil, Le Men & 1.  
I.L., DH34, G-EBBR, London-Brussels, 14.14-16.25, Nil, 1, Barnard.  
M.A., Breguet, F-ADAU, Paris-London, 16.08-09.10, G., Nil, Perignon.

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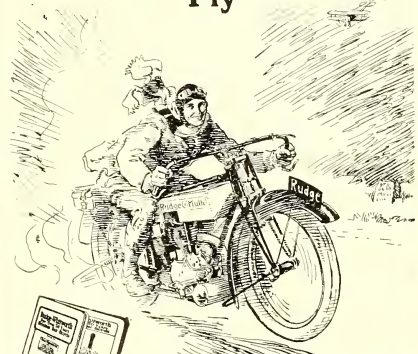
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D.A., D.H.34, G-EBBS, Paris-London, 13.57-16.06, Nil, 3, Herac.  
H.P., D.H.8, G-EAWH, Paris-London, 15.02-17.41, Nil, 2, Dismore.  
L.L., D.H.8, G-EAKO, Paris-London, 15.40-18.12, G, 1, Shepperson.

### Flying by the Aircraft Disposal Co.

May 4th.—Martinsyde, G-EATD, Brussels return (Muir); four D.H.9s, tests (Stockall); D.H.9 test, (Foot).  
May 6th.—D.H.96, G-EAXC, Brussels return (Muir).  
May 10th.—D.H.94, G-EAXC, Brussels return (Muir).  
May 11th.—D.H.94, G-EAXC, Brussels return (Muir).  
May 12th.—D.H.94, G-EAXC, Lille return (Muir).  
May 13th.—Nil.

### Inland Flying at Croydon.

May 8th.—D.H.1, two D.H.6s Stag Lane return (Barnard and Cobham);  
Vickers "Vulcan" return (Cockerell).  
May 9th.—D.H.1, D.H.9, Stag Lane return (Cobham); M.W. Avro test (Shaw); H.P., W.8, test (Wilcockson).  
May 10th.—D.H.1, D.H.5 Stag Lane return (Barnard); L.L., Westland test (Powell); H.P., W.8, test (Wilcockson).  
May 11th.—D.A., D.H.34, tests (Horne); L.L., Westland, tests (Robins and Jones); S.F., Avro, joy-rides.  
May 12th.—L.L., Westland from Yeovil (Powell); D.A., D.H.34, from Stag Lane (Horne).  
May 13th.—D.H.1, D.H.9, Stag Lane return (Cobham); L.L., D.H.4, Manchester return (Powell); S.F., Avro, joy-rides (Muir); D.A., D.H.34 from Stag Lane (Horne); D.H.34, two tests (Woods-Humphrey).  
May 14th.—S.F., Avro, joy-rides (Muir).

### Cross-Channel Statistics.

Week ending May 14th:—  
Machines, 202; Passengers, 261; Crews, 207; Total Personnel, 468  
Corresponding week last year:—  
Machines, 82; Passengers, 313; Crews, 161; Total Personnel, 444  
Corresponding week, 1920:—  
Machines, 75; Passengers, 161; Crews, 87; Total Personnel, 250

### The London Terminal Aerodrome.

On Monday of last week Capt. Stocken put four D.H.9s through their tests, and Major Foot also did likewise with a fifth. Mr. Muir went to Brussels and back on the Martinsyde, which Mr. Longton flew in the mces, to collect photographs of the Royal visit to Belgium.

Mr. Muir also flew to Belgium and back on Tuesday, Wednesday, Thursday and Friday on the D.H.9a which did so well in the Easter races. On the Tuesday he completed the trip safely, although in starting he damaged an aircsrew, which had to be changed.

The pilots of the De Havilland Aircraft Company, Messrs. Cobham, C. D. Barnard, and Broad, have also been making daily trips to Belgium to collect photographs, and Mr. George Powell on Saturday flew to Belgium on the D.H.4a of the Instone Air Line on a similar errand. On his return to Croydon, he flew up to Manchester and back on the same machine to deliver a duplicate set of plates to the Manchester office of the paper which had hired the machine.

Three new appointments of pilots were made during the week. Major Foot has returned to Handley Page Transport, for whom he flew regularly from August, 1919, to March, 1921. Mr. Keys, who was well known in the Service for having fallen off H.M.A. R.23 in a "Camel," and for having shot down a Zeppelin, has joined the Instone Air Line. Mr. Dickinson, for some time pilot to the Berkshire Aviation Company, has joined the Daimler Airway.

Handley Page Transport have two W.8s now running on the service, and all the pilots like the machine very much. The original one, G-EAPJ, is almost ready again, and the fourth of the series should be in action before the end of May.

Mr. Cogni told one of an amusing happening during the week. He was bringing two passengers, who had never previously flown, to the aerodrome in his car. On the way he overheard remarks from these passengers, who were apparently not too sanguine as to the safety of air transport. Mr. Cogni presently turned round and asked them if they had got any literature to read as the air trip was remarkably boring and dull. This statement quite calmed their fears, and they stopped at the next stationer's and bought some papers which they read during the trip, apparently taking no more interest in the journey than do passengers by train.

The Instone Air Line began a twice daily service to Paris during this week.

Mr. Brady took a D.H.34, G-EABT, to Paris on Thursday morning, returning in the evening. It made an exceeding good landing, one of the very best D.H.34 landings one has yet seen. For some unexplained reason the port wheel came

off and rolled across the aerodrome, almost delivering itself to the Disposal Company.

As the machine slowly up it dropped on to the axle and stood slowly and gently on its nose. Unless the landing had been good and slow, considerable damage must have ensued, whereas actually the aircsrew was smashed and the nose slightly damaged. Naturally it was very annoying to Mr. Barnard but as it was clear to all that there was no error of pilotage, all energy was naturally better used up in repair of the machine than in attaching blame. The machine was accordingly ready again for test on Sunday night.

Mr. Barnard left for Brussels on the other D.H.34, G-EBER, which Mr. Holmes brought from Stag Lane on Saturday. On Sunday afternoon, with four passengers up, the machine took off well and showed a good climb.

All the D.H.34s have now had their leading edges finished off with three-ply wood, which improves their getting-off considerably.

The Daimler Airway now have their complete complement of machines. Mr. Herne brought over G-EBBQ, the original "34" which was damaged in a forced landing in France a month ago, from Stag Lane on Friday evening, carrying his motor-cycle, on which he reached Stag Lane, in the cabin. On Saturday morning he brought over G-EBBS. The third machine, G-EBBU, has been hard at work on the Paris route during the week, doing the double-double journey on most days.

On Saturday afternoon the general manager of the Daimler Airway, Major Woods-Hampshire, flew the D.H.34 in order to get to his "B" licence. First he had Mr. Herne in the passenger's seat and then he disembarked Mr. Herne and went solo. On both occasions he made faultless landings.

The Daimler Airway now run three services a day each way. There are now 26 regular services in and out each day, 18 of which are British, four are French and four are Dutch.

Handley Page Transport leave for Paris at 10.00 hrs. and 12.00 hrs., and arrive from Paris at approximately 14.30 hrs. and 17.15 hrs.

The Instone Air Line leave for Paris at 11.30 hrs. and 16.00 hrs., and arrive from Paris at approximately 13.45 hrs. and 18.15 hrs.

The Daimler Airway leave for Paris at 08.30 hrs., 12.45 hrs. and 14.30 hrs., and arrive from Paris at approximately 13.35 hrs., 17.30 hrs. and 19.35 hrs.

Grands Express dispatch a machine for Paris at 14.00 hrs. and receive one also at about 14.00 hrs., and Messageries Aeriennes send to Paris at 13.15 hrs. and receive one at about 15.45 hrs.

The Instone Air Line send machines to Brussels 11.55 hrs. and 16.05 hrs., and machines should arrive from Brussels at 14.00 hrs. and 18.30 hrs.

The K.L.M. send machines to Amsterdam 10.00 hrs. and 14.00 hrs., and receive incoming machines at 14.15 hrs. and 18.15 hrs.

All this information can be obtained, together with times and fares of air lines all over Europe and Northern Africa, in an excellent and accurate illustrated time-table, entitled "By Air," produced by the Leparcial Travel Bureau, which will be sent to anyone on application.

The D.H.106 which used to serve the late A.T. and T. so well in the good old days, have been acquired by the De Havilland Aircraft Co., who are refitting them and intend to use them on an inland service at an early date. It seems quite extraordinary that these machines were not snapped up by the Air Lines, for a better stand-by machine or newspaper service machine it would be hard to imagine.

Mr. Muir has been doing a large amount of joy-riding during the week with his Avro, and on Sunday he was giving instruction to a pupil.

Mrs. Atkey has been doing some flying on a Royal Aero Club Avro and making excellent landings.

It is understood that certain people are already considering the titles they will assume in the event of a peerage for successful circumnavigation being thrust upon them. Several very apposite titles have already been evolved.

One is told that one of the new officers erected on the aerodrome is for some subtle reason to be known as "The Vatican." Owing to the extraordinary bright colour scheme of the be-flagged offices down the aerodrome "Broadway," and its resemblance to a village fair, one occupant of the aero-

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drome says that he always thinks it must be lunch time as he cannot hear the music of the roundabouts.

Mr. Shaw, who guides the destinies and pipe-lines of Shell petrol at Croydon, tells one that he is trying to evolve a new form of aero engine which uses at least 10-gallons of petrol per horse-power per hour. He thinks that a 1,000-h.p. engine of this type fitted to all commercial machines would be ideal and he cannot think how commercial aviation has reached its present stage without the aid of such an engine.—G. D.

### Parachute Tests at Croydon.

On Saturday, May 6th, some tests were made with new types of Guardian Angel parachutes. The first drop made was of a dummy man with a "H" Type "Guardian Angel" parachute with standard 28-feet silk body. The dummy man was carried in the new Frontal Suspension Harness, fitted with Instant Connector and Quick Release, the life-line attaching the dummy man to this parachute being fitted with a small "resistance" parachute to show the advantage of providing additional resistance to speed up the disconnection of a "Dropping" Type Parachute in a nose-dive. The "H" Type parachute opened with much greater speed than any of Mr. Calthrop's earlier types, but with great elasticity, and the connection of the apex of the body with an 8-feet reaction tape lowered the disconnection of the body from the container to such an extent that, when released, it passed at least 30-feet below the tail skid.

The test showed that the small resistance parachute which was only four feet in diameter perceptibly speeded up the extraction of the main parachute and pulled the dummy considerably to the rear of the normal path.

Although the resistance parachute opened instantly, Mr. Muir, the pilot, reported that no shock was felt on his machine, so next time it will be safe to employ a resistance parachute of much greater area.

In the second flight the dummy was dropped with an "H" Type parachute fitted with a newly-invented "Calthrop" body, with three rings of air-pockets, the object of which is to produce enhanced effect of the compressed air passing under the periphery of the body, and thus to give additional resistance. In order to proceed with caution the air-pockets were contracted to about one-tenth of their full extension.

The opening of the body was extraordinarily quick, but perfectly elastic; and again Mr. Muir reported that there was no shock to his machine. The experiment showed that the descent was appreciably slower. Next time this body will be tested with its pockets fully extended.

On this occasion the "H" Type parachute repeated its particularly speedy and elastic opening, and the body apex, fitted with the 8-feet reaction tape, passed the tail skid about 35 feet below it. The tail skid difficulty thus appears to have been permanently overcome.

In this same flight, a small Teddy Bear was carried on the lower type to test, in model form, the action of "soaring" type parachutes. This was fitted with a pilot and intermediate parachute. It acted perfectly and the pilot, intermediate and main parachutes all came down in a perfectly straight line without any kind of wobbling, which has been previously experienced with parachutes in tandem and chain, so that this difficulty has apparently been overcome. In the third flight Mr. Reed, Mr. Newell's assistant, made a first drop in a D.4 Type "Guardian Angel" parachute and was delighted with his experience.

The whole of the experiments were carried out from a Royal Aero Club Avro, piloted by Mr. Muir.

### Beeston, Notts.

The Berkshire Aviation Tour have been flying here since Tuesday of last week. The famous Avro G.E.A.S.F., called by Mr. Ferrand "Old Faithful," has been undergoing spring cleaning, but will be out again this week.

Mr. Cox has been on leave, so Mr. Ferrand has been flying his Avro, and took about 30 passengers on Thursday and on Friday Mr. Cox took about 30.

### Brooklands.

The Instone "Vulcan" has returned to the Vickers works for minor modifications, but will most probably be finally delivered at Croydon on Tuesday of this week. One is informed by Mr. Maxwell-Mallat that eight "Vulcans" will be constructed to order, five for the Instone Air Line, one for the Air Ministry, and two for the Australian Government. Those concerned with the design and construction of the "Vulcan" are very pleased with her performance on test.

A "Viking IV." was sent off to Canada on May 10th, for the Canadian Forestry Department, which is, one understands, a semi-detached-Department run by the Canadian Government and employs aircraft for mail-carrying, forest surveying, etc.

Vickers intend to develop the all-metal machine. They hope to produce an all-metal passenger carrying machine within twelve months. It will take practically all of this time to evolve a satisfactory aeroplane of entirely metal construction.

Mr. Muller is of the opinion that in the space of five years there will not be an aeroplane in use partly or wholly constructed of wood.—J. F. S.

### Wells.

The Berkshire Aviation Company have been flying recently at Wells. Mr. Robinson has taken up a large quantity of people in the Avro and also indulged in exhibition flying.

Messrs. J. D. V. Holmes and Taylor have been giving exhibitions of wing-walking before large crowds of spectators. The reporter of the local news-sheet seems to have enjoyed the visit immensely.

### THE IRAQ MAELS.

The Postmaster-General states that the Air Mail which was dispatched from London on May 4th reached Baghdad on May 12th-13th. The mail due to be dispatched by air from Baghdad on May 13th reached Cairo on the next day, and letters included in it for this country should arrive in London about May 22nd.

The next Air Mail to Baghdad will be dispatched from London on Thursday next, May 18th.

### ENGINE TESTING EXTRAORDINARY.

During the course of the negotiations with the Zeppelin Company which led to the formation of the Spanish company which is to run an airship service between Spain and the Argentine, the German airship experts were asked what engine they would propose to use. Naturally the Maybach was put forward as the only airship engine, but it was admitted to be a war engine and not one which had been designed solely with a view to commercial reliability on long distance routes. The type stood up well to the German official 50 hours' test, but it was suggested that 50 hours—particularly a broken 50 hours—was not quite comparable to the conditions of the proposed service.

The German engineers at once expressed their belief that it would be possible to build a much more satisfactory commercial engine, but that they were not then allowed to build such an engine in Germany, and that money would be needed to build it elsewhere. The money was forthcoming, and an engine was built in a Dutch workshop.

This engine has now been completed. It is of between 400 and 500 h.p., weighs it is understood between 3½ and 4½ lbs. per h.p., has a very low petrol and oil consumption—which is much more important for airship work than is low engine weight. It has run satisfactorily for 23 days continuously on the test bed at its full normal power—which is presumably somewhere round 80 per cent. of its maximum output. That is to say it has done a non-top run of 552 hours, approximately.

While one is discussing Maybach engines, it is somewhat interesting to mention the fate of the 300 standard 300 h.p. engines of this make which were sent to this country by the Inter-Allied Commission of Aeronautical Control. All these engines were of the latest type, and either new or in perfect condition. With the exception of some two or three which have been used for experimental purposes every one of them has been destroyed and the cost of packing and transport wasted. "And that is why your income tax, etc., etc."

### PERSONAL NOTICES.

#### ENGAGEMENTS.

BAYES-BARROW.—A marriage is arranged, and will shortly take place, between Lieut-Col. J. C. Bayes, O.B.E., R.A.F., and Mollie Bonville, second daughter of Colonel W. F. Barrow, V.D., J.P., and Mrs. Barrow, of Ancells, near Heath, Bucks.

FLETCHER-HAY.—The engagement is announced between F/Lt. Albert William Fletcher, D.F.C., A.F.C., R.A.F., youngest son of the late Mr. C. Fletcher and Mrs. Fletcher, of Childs Hill, N.W., and Marjorie Elliot Hay, only daughter of Dr. and Mrs. Walter Hay, of Thame, Oxon.

OWEN-DANIEL.—The engagement is announced between Major H. M. Owen, A.F.C., late of the Dorsetshire Regt. and R.A.F., son of Mr. and Mrs. W. Haddon Owen, of Louth, Lincolnshire, and Anna Hardy (Oliver) Daniel, elder daughter of Mrs. Barnett, of Cribdall, North Berwick.

#### MARRIAGES.

JONES-DAVIES.—On May 8th, at the Wesleyan Chapel, Charles Street, Cardiff, Capt. Simon Jones, D.F.C., late 25 Sedn., R.A.F., son of Mr. and Mrs. J. Jones, Frenshly, Llanybyther, to Jane M. Davies, daughter of the late Capt. Davies and of Mrs. Davies, Bodrydion, Aberystwyth.

SAKER-TOWNSEND.—On May 6th, at St. Mary's Church, Alverstoke, by the Rev. G. London, Harold John Saker, R.A.F., to Stella, youngest daughter of the Rev. R. W. and Mrs. Townsend, 7, St. Mark's Road, Alverstoke.

#### BIRTHS.

HASWELL.—On April 30th, at "Strachur," Radlett, Herts, to Rosary, wife of Capt. J. Eric Haswell (late R.A.F.)—a daughter.

HORSEY.—On April 30th, at Outrath Lodge, Stoke, Devonport, the wife (nee Ethel Hughes) of F/O. H. J. Horsey, R.A.F.—a son.

HORSLEY-CARR.—On May 17th, at 35, Devonshire Street, W., to S/Ldr. and the Hon. Mrs. Horsley-Carr—a daughter.

HUSKINSON.—On April 20th, at Caythorpe, Lincs, Mrs. Huskinson, the wife of F/Lt. Huskinson, M.C., R.A.F.—a daughter.

ROBERTSON.—On May 6th, at 18, Linden Road, Exhill, the wife of Wm. (Capt. E. D. M. Robertson, R.A.F.—a son.

WHITAKER.—On May 12th, at 4, Horton Crescent, Rugby, the wife of F/Lt. Raymond Whitaker, R.A.F.—a daughter.

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	See Advertiser Page		See Advertiser Page
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"Propellers," Leeds. Roundhay 601 (5 lines) .....	359	Spencer, C. G., & Sons, Ltd., 66a, Highbury Grove, London, N.5.	
Bristol Aeroplane Co., Ltd., The, Filton House, Bristol		"Acronaut," London. Dalston, 1893 .....	361
"Aeroplane," Filton. Bristol 3906 .....	Back Cover	<b>CORDS, THREADS, TAPES AND WEBBING.</b>	
De Havilland Aircraft Co., Ltd., The, Stag Lane Aerodrome,		MacLennan, John, & Co., 115, Newgate Street, London, E.C.1.	
Edgware. "Havilland," Edgware. Kingsbury 160-1, (2 lines) .....	355	"Vandura," Cent, London. City 3113 .....	Front Cover
Fairey Aviation Co., Ltd., The, Hayes, Middlesex "Airily" .....	349	<b>DOPES.</b>	
Hayes, Middlesex. Hayes, Middlesex 19 .....	357	Cellon (Richmond) Ltd., 23, Cork Street, London, W.1. "Ajabw,"	
Handley Page Ltd., Cricklewood, London, N.W.2. "Hydrobid" .....	357	Reg. London. Gerrard 440 (2 lines) .....	359
Crickle. Hampstead 7500 .....	357	Titanite, Ltd., Empire House, 175, Piccadilly, London, W.1	
Parnall, George, & Co., Coliseum Works, Park Row, Bristol		"Tetraflex," Piccy, London. Gerrard 3212, Regent 4728 .....	Front Cover & 359
"War V's," Bristol. Bristol 4773 (2 lines) .....	357	<b>ENGINES.</b>	
Roe, A. V., & Co., Ltd., Newton Heath, Manchester. "Triplane" .....	357	Armstrong Siddely Motors, Ltd., Coventry. "Sildarm," Coventry	
Manchester. City 8330-1, Manchester .....	Inside Front Cover	177. Coventry 554 .....	355
Short Brothers (Rochester & Bedford), Ltd., Scauplane Works,		Bristol Aeroplane Co., Ltd., The, Filton House, Bristol. "Avia-	
Rochester, Kent. "Scauplane," Rochester. Chatham 627 .....	357	tion," Filton. Bristol 3906 .....	Back Cover
Inside Back Cover		<b>FLOTATION AIR BAGS.</b>	
Supermarine Aviation Works, Ltd., The, Southampton. "Super-		R.F.D. Company, 21, Queen's Road, Hershaw, Surrey.	
marine," Southampton. Woolston 37 (2 lines) .....	359	Esher 365. ....	364
Vickers, Ltd., Vickers House, Broadway, London, S.W.1.		<b>MOTOR BICYCLES.</b>	
"Vickers," Vic, London. Victoria 6000 .....	359	Rudge-Whitworth, Ltd., Coventry. "Rudge," Coventry.	
Westland Aircraft Works, Yeovil. "Aircraft," 141 Yeovil.		Coventry 1104 .....	361
Yeovil 141 .....	353	<b>STEEL TUBING.</b>	
<b>AIR LINES.</b>		Accles & Pollock, Ltd., Oldbury, Birmingham. "Accles" Old-	
Berkshire Aviation Co., Ltd., East Hanney, Wantage, Berks .....	361	bury. Oldbury 111 .....	361
Instone, S., & Co., Ltd., 51, Leadenhall Street, London, E.C.			
Avenue 366-S .....	361		
<b>ALUMINIUM PISTONS.</b>			
London Die Casting Foundry, Ltd., The, Tremlett Grove, Junction			
Road, Holloway, N.19.			
"Carcoal," Uphol, London. Hornsey 1580 (2 lines) .....	364		

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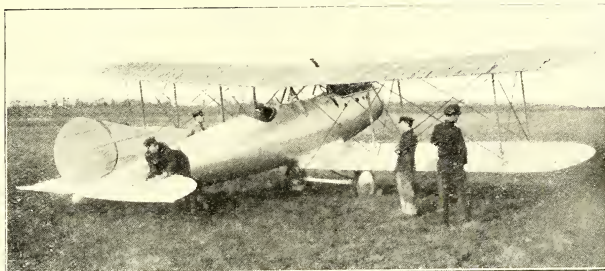
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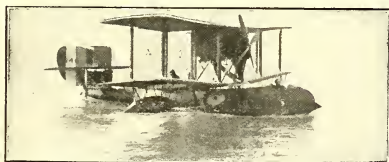
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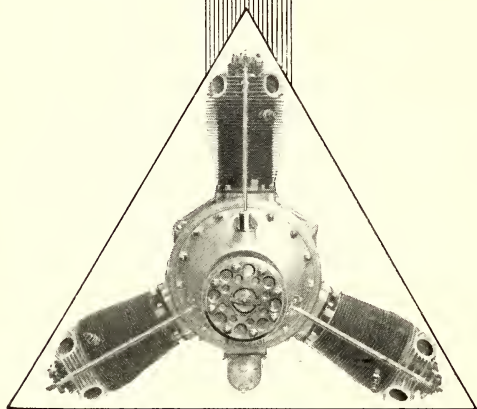
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WEDNESDAY, MAY 24, 1922.

Edited by  
C. G. G. G.

Vol. XXII. No. 21.

SIXPENCE WEEKLY.

[Registered at the G. P. O.  
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## THE QUEEN OF THE ADRIATIC.



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## ON SERIOUS TRANSPORT AND CIVIL AVIATION.

Civil Aviation is to be congratulated on the fact that it has been officially adopted as being among the objects of the Institute of Transport. That is to say, men with practical experience of transport and not merely enthusiasm for aviation are concerning themselves more or less with the problems of air transport.

During the past week the Institute of Transport, which was founded some three years ago, held an International Congress in London, at which some hundreds of the leading people connected with transport by sea and land were present. It was notable, however, that very few people concerned with air transport had anything to do with the Congress.

In fact so far as one can gather only two or three people concerned with air transport are members of the Institute of Transport. This seems to indicate shortsightedness on the part of the air transport people, for it is all to their advantage that they should work in with the older forms of transport and should be on friendly terms with the important people concerned therewith.

### The Institute of Transport Congress.

The proceedings of the Congress opened with a reception by the Lord Mayor at the Mansion House on Wednesday, May 17th. There the only person directly concerned with aviation who was present was Sir William Foxton Hicks.

On the Thursday morning, May 18th, Capt. Riall Sankey read an excellent paper on wireless in relation to transport, in which he devoted quite a considerable amount of time to discussing wireless in connection with air transport. Capt. Sayers deals with this part of his paper in the "Aeronautical Engineering Supplement" this week.

On the evening of the 18th the Institute held its third Annual Dinner at the Savoy, with its President, Sir Henry P. Maybury, K.C.M.G., C.B., in the Chair. The guest of the evening was the Rt. Hon. Edward Shortt, K.C., M.P., Secretary of State for Home Affairs. The only aeronautical people present were Sir Henry White Smith, of the Bristol Co., and Mr. H. T. Vane, of Napier's, neither of whom is in the Air Transport business.

Mr. Shortt, in proposing the toast of the Institute of Transport and the Transport Industry, congratulated the Institute on having in three years raised its membership from 20 to 1,000. He confessed to being an ignoramus on the subject of transport, but showed that in fact he knew a good deal about it. He congratulated the Institute on having taken unto itself the latest form of transport, namely, air transport.

He said that he remembered his first connection with aviation, which was sitting on a Committee in 1916 to investigate charges which were made against our Air Services. He pointed out that aviation has at present the advantage of not having to pay rates, but he assured those present that the Government was going to get money out of air transport sooner or later. Incidentally, one would remark, that everybody concerned with aviation will be delighted when the time comes in which aviation shows a profit to be taxed.

Mr. Arthur Neal, M.P., Parliamentary Secretary of the Ministry of Transport, in replying for the guests, pointed out that the Institute of Transport was the most important of all Institutes, in that the Institutes of Civil Engineers and Mechanical Engineers and Electrical Engineers merely trained men to handle transport. He admitted, humorously, that in return for an equally good dinner from any of the Institutes he was prepared to show that each Institute in its turn was the most important. But he said that really the Institute of Transport, although the youngest, was born in the fulness of time the greatest of all. The prosperity of a country could be measured by its progress in transport. This is a remark which those concerned with air transport would do well to lay to heart.

### How Not To Transport.

On the afternoon of Friday, May 19th, some 150 or 200 members of the Congress visited the Croydon Aerodrome in order to study air transport. It was a brilliantly fine afternoon and ideal for flying, notwithstanding a fairly strong wind from the South-West. A large array of machines of various kinds was dragged out onto the aerodrome to be

inspected by the visitors, including the two machines which won the two First Prizes in the Air Ministry Civil Air Transport Competition in 1920, and were afterwards purchased by the Department of Civil Aviation.

The peculiarity about these two machines seems to be that they are never flown and spend their time in the sheds at Croydon, except when they are dragged out to sit on the ground and be inspected on occasions such as this visit.

The only flying that the delegates saw was a flight by Mr. Stocken on a D.H.9 with a Mercedes engine, which was in fact going up for a height test and had nothing whatever to do with the demonstration, and a flight by Mr. Barnard on a D.H.34, which was being tested with a two-blade airscrew instead of a three-blade. No machines left for Paris and no machines arrived from Paris.

The weather indication board showed clear weather at Le Bourget, and a thousand yards visibility at Abbeville, but only about fifty yards at Lympne and fifty yards at St. Inglevert. This indicated a thick Channel fog which probably had a ceiling at about a thousand feet. Three machines left Paris which should have arrived at Croydon during the demonstration, but all three returned to Paris after reaching about a latitude of Berck.

The visitors were shown all over the aerodrome buildings by Capt. Baker and the other officials of the aerodrome and were doubtless greatly impressed by the vast arrangements and the enormous capital outlay for a method of transport which apparently does everything except transport.

### A Lamentable Fiasco.

The whole thing was a splendid demonstration of the thorough ineptitude of air transport as practised to-day. One of the old-time pilots who was present remarked that the standard of piloting on the London-Paris route to-day is nothing like as high as it was in the early days of Air Transport and Travel Ltd. three years ago. One ventured to point out to him that the pilots are just as good and the machines and engines a trifle better.

The difference is that in those days pilots were all out for the honour and glory of aviation and were prepared to push off in any kind of weather and go through anything. To-day, three years later, except for the reliability of engines, thanks to the good work of the Napier and Rolls-Royce firms, cross-Channel flying is in fact not one whit less dangerous than it was three years ago.

Consequently when it is a matter of either blinding through low clouds or flying over fog without any idea of what is below the machine the pilot of to-day simply says that the proposition is not good enough. So he either goes back to his starting point or lands and waits for the weather to clear, when the pilot of three years ago would have gone through it.

One does not in the least blame the pilots. They would be fools if they risked their lives and the lives of their passengers under such conditions when it ought to be possible for them with proper aeroplanes and proper ground organisation to go through under such conditions with something very like perfect safety.

### Considered Opinions.

The other night one was talking to one of the World's greatest aeroplane designers, who incidentally has not been asked to build commercial aeroplanes but who invariably flies in his own Service machines when they are out on their first test flights. His remark was: "When you see me flying to Paris you can reckon that air transport is safe," and one of our very best test pilots who was present capped his opinion by saying that he too would fly to Paris as a passenger when he thought it was safe to do so.

So long as it is not safe for aeroplanes to fly over 40 or 50 miles of ordinary Channel fog which overflows a few miles of country on each side of the coast it may be taken as an axiom that air transport is a failure.

### The Desiderata.

What are wanted, as one pointed out a year or two ago, are, firstly, observation posts on the ground at say 20 mile

intervals along the air lines in certain valleys and on certain ridges to say whether the clouds or fog are down to the ground at those points or whether there is clear air below and also what the visibility is at those points.

It is also necessary to have each machine in constant wireless contact with ground stations so that it can be told at any minute precisely over what piece of ground it then is.

Over and above that it is necessary to have machines which although they can cruise at something between 60 and 100 miles an hour can be flown under proper control at not more than 40 miles an hour. The 40-mile-an-hour flying speed is necessary so that if a machine is coming down through a fog owing to engine trouble and if the pilot on nearing the ground sees a church steeple looming out of the fog fifty yards ahead of him he can turn out of its way in time.

And a 20-mile-an-hour landing speed is necessary so that a machine can be practically dropped on to the ground without running more than a few feet after touching and so that if it does happen to hit anything before it touches the impact

### THE ROUND-THE-WORLD PROPOSITION.

One of the standing reproaches against aviation—so far as English business men are concerned—is that flying is not a commercial proposition. It has apparently been left for Major W. T. Blake, better known to readers of the non-technical press as "Wing Adjutant," to prove the contrary, for the projected Round-the-World Flight which he has initiated and boomed looks like being as commercially successful and very nearly as amusing as Mr. Robey's "Round-in-Fifty."

As Major Blake is too young to have had any considerable business experience, he is, therefore, to be the more congratulated on having thus taught our merchant princes something that they did not know.

So far as one can gather the flight is being financed by a successful cinematograph *entrepreneur* who has been wise enough to see the commercial value of the flight. Previous big flights have either been made for big prizes on the principle that no success meant no pay—as in the case of the Smith Brothers' splendid flight to Australia—or for pure honour and glory—as in the still more splendid flight of Messrs. Parer and Macintosh to Australia, or the Van Ryneveld-Brand flight to South Africa, or the Messiero-Ferrarin flight to Tokio. This flight has every chance of being of commercial value from quite near the start.

Given sufficient public interest in the flight cinematograph films taken from the machine or of the machine along the route will fetch quite a high price per 1,000 feet. And every 1,000 miles travelled means so many 1,000 feet of film and so many £1,000 immediate revenue. Thus, before the flight has proceeded very far the initial capital outlay can be recovered, and even if the aviators do not ultimately succeed in "setting a girdle round the Earth" there is every chance of the expedition showing a handsome profit to all concerned.

So long as the gaps between the instalments of the Great Serial are not too great public interest will not flag, especially if it is stimulated periodically by snatches of narrative in the daily press couched in Major Blake's own particular style. Therefore the voyagers need not hurry themselves, for there is no time-limit except the patience of the British Public, which in things cinematographic passeth all understanding.

There is no doubt about public interest at the moment. The projected flight by the Smith Brothers had concentrated attention on who would have been a great sporting attempt, both on the part of the Brothers and on the part of their backers, Vickers, Ltd., who stood to gain something in reputation if the attempt succeeded and stood to lose a great deal in cash and kudos if it failed. The lamentable death of Sir Ross Smith rather increased than decreased public interest in the great problem of flying round the World. Therefore it only needed the true commercial mind to seize the situation and profit by it.

The business opportunity has not been allowed to escape. It remains to be seen whether it will develop into a dividend-paying investment.—C. G. G.

### THE ADVENTURES OF MAC, BROOME, & WILFRED.—I.

There was an amusing gathering of visitors [including a representative of THE AEROPANE—Ed.] at the Victoria Hotel on Monday, who were entertained to a farewell lunch to Mr. Norman MacMillan, Lt.-Col. L. E. Broome and Major Wilfred Blake, prior to their voyage to an Easterly direction in the Northern Hemisphere.

Lord Montagu of Beaulieu proposed the toast of "the aviators," which Sir Sefton Brancker seconded. The latter said in no uncertain words that he thought they were starting too late in the year for success, but nevertheless he hoped they would look after themselves, make their watchword "Safety First" and not come to any harm.

Major Blake in dulcet tones outlined his plans and stated that the most important member of the expedition was naturally the pilot, and paid tribute to Mr. MacMillan's skill, with

is so slight that nobody is likely to be seriously injured. The human frame is built to take a 20-m.p.h. impact and no more.

### Why Delay?

All these desiderata are obtainable to-day and could have been obtained a year or more ago if the Department of Civil Aviation had turned its attention to the practical needs of Civil Aviation instead of paying tens of thousands of pounds for perfectly useless objects, including the subsidising of aeroplanes which are manifestly unfit for air transport.

Twelve months hence it will be possible to judge whether Sir Sefton Brancker is a success or a failure as Director of Civil Aviation by the amount of progress Civil Aviation has made towards bringing into regular use ground organisation and aeroplanes which fulfil the requirements set forth above.

When the cross-Channel air lines run regularly under such conditions of safety it will be well worth the while of the Institute of Transport to take a practical interest in Civil Aviation. Until then the Institute may well confine its interest to pleasant sunny afternoons at Crovdon.—C. G. G.

which everyone heartily agreed. He also spoke very highly of the work done in getting the machines ready by the Aircraft Disposal Company.

He stated that the expedition was financed by one man only whose name was known only to Major Blake, and he stated that he (Major Blake) never talked of "if they get home," but "when they get home." Naturally one hopes that they will get home even if it is by boat and train, because accidents do so much harm to aviation in general.

Lt.-Col. Broome spoke of the difficulties they had encountered in filling in on the passport form that section which dealt with peculiarities. However, as Major Blake has successfully negotiated that, the rest of the flight should be child's play in comparison and much less arduous.

He also said "In the note of our engines and in the roar of our exhausts we shall hear the deep throbbing tones of Francis Drake's drum, beating us home again." Doubtless Major Blake's hearty laugh will also lend itself admirably to the general harmony.

Mr. MacMillan impressed everyone by his inability to make a speech, which is a sign that he is well able to get things done the more efficiently.

Major Cadbury, of K.N.A.S. fame, read one of the best speeches of the afternoon, though it was marred by his using the word "anticipate" to mean "expect." Perhaps, owing to his close family ties with the daily press this was "only to be anticipated."

Lord Riddell, replying for the guests, said that it was amusing to think that Major Cadbury, who had brought down two Zeppelins during the war, was a product of a pacifist newspaper.

Among those who regretted their absence was Mr. Owen Nares. Quite what his connection with such a flight could be, one could not understand, unless he intended to understand Wilfred.

Mr. Eugene Sandow was among those present and it seems that his proper function would be either prop-swining or carrying to the machine all the vast amount of well-advertised proprietary stores required by the expedition, or else to lift the machine into the air when fully loaded. For some strange reason "Uncle Dick" of the *Daily Mirror* was not present.

Everyone will wish that the members of the expedition may come to no harm.—C. G. G.

### TO EX-OFFICERS OF THE R.A.F.

On May 18th, Mr. Baldwin RAPEL asked the Secretary of State for Air whether his attention has been drawn to the fact that a certain firm of bankers are endeavouring to recover from ex-officers money which was paid to them in error by that firm a considerable time ago and accepted by them in good faith; and what steps does the Ministry propose to take in the matter?

Captain GUEST: If my hon. Friend will give me particulars of the cases he has in mind, I will investigate them and send him a reply.

Mr. RAPEL: While thanking the right hon. Gentleman may I ask why the Air Force entrusts the payment of their officers to two banks, one of which carries it out in a businesslike way and the other in an unsatisfactory way? Why not entrust the payment of officers of the Air Force to one bank?

Captain GUEST: I will make enquiries.

Mr. L. MURPHY: Is there any reason why the Air Force should not adopt the policy of the Admiralty, and not give a monopoly to any private bank at all?

Captain GUEST: If the hon. Member will put down a question on the subject in a few days, I will give him a reply.

[Any ex-officers of the R.A.F. who are being threatened with prosecution by bankers in order to secure return of money paid are asked to communicate with the Editor of this paper.—Ed.]



## R.A.F. INTELLIGENCE.

## A Royal Visit.

On Saturday last, May 20th, the R.A.F. Units at Farnborough had the honour of giving a demonstration of the uses of aircraft in War before their Majesties' the King and Queen.

Their Majesties first visited the R.A.F. aerodrome on Cove Common, and afterwards witnessed the demonstration from an enclosure on Cove Hill, where S/Ldr. C. H. B. Blount, M.C., commanding No. 4 Squadron, R.A.F., S/Ldr. R. M. Hill, M.C., A.F.C., commanding the Experimental Section, R.A.E., and Mr. W. Sydney Smith, C.B., O.B.E., Superintendent, Royal Aircraft Establishment, were in attendance on their Majesties.

Four Bristol Fighters piloted by F/Os. H. G. White, C. H. Harrison, B. R. Harris, and J. McBain, D.F.C., gave a demonstration of formation bombing against an imaginary infantry battalion and scored a creditable proportion of direct hits. Following this a tank made an attack on an imaginary strong-point, taking its direction by wireless telephone from an aeroplane piloted by F/O. C. L. King, M.C., D.F.C. Further demonstrations of wireless telephony were given by pilots of No. 4 Squadron.

Thereafter the officers of the Experimental Section, R.A.F., gave a demonstration of air fighting. A D.H.10, playing the part of a bomber returning from a raid, was attacked by Nighthawks, and S.E.5As which were flown in a very capable manner. After landing the machines taxied into line facing the Royal enclosure, where they were inspected by the King and Queen.

## The R.A.F. in India.

It is now made known that Vice-Marshal Sir J. M. Salmond, K.C.B., is proceeding to India at the end of the present month. According to previous announcements Sir John does not take command in Iraq until October. It is therefore to be assumed that he will spend July, August and part of September in India.

From this it may be deduced that the R.A.F. in India is to undergo a thorough overhaul. It has been known for some time that matters were not going altogether satisfactorily with the R.A.F. in India. Also the position in relation to the Army has needed attention. Apparently the military side of the Indian Government was not even yet understood, the possibilities of aircraft in frontier warfare, and as a result the R.A.F. has not been used to advantage in India during the last few years. It is possible that this neglect to use the R.A.F. to the best advantage may have been due in part to the R.A.F. itself.

It is therefore very much to the advantage of the R.A.F. that so thoroughly competent an officer as Sir John Salmond should undertake the task of putting the R.A.F. in India on a proper footing both internally and in its relation to the Army. One wishes him every success in this important work.

## The R.A.F. Memorial.

At the last meeting of the Executive Committee of the R.A.F. Memorial Fund the Secretary stated that Sir Reginald Blomfield, the architect of the R.A.F. War Memorial to be erected at the Whitehall Stairs, has placed a scale model of it in the Architectural Room at the Royal Academy, where it will probably remain during the Season.

It was announced that the R.A.F. Pageant would be held at Hendon on Saturday, June 24th next.

It was pointed out with regret that "Woodcote," Ascot, the remaining house acquired by the Fund under the Salting Benefaction, had not yet been sold. The Committee are prepared to accept a lower price than that fixed for the house last year.

The question of holding an R.A.F. Ball in aid of the Fund next Winter was discussed.

The Hon. Mr. P. C. Larkin, the new High Commissioner for Canada, was unanimously appointed Vice-President of the Fund.

A communication was received from Air Vice-Marshal Sir John Salmond, K.C.B., resigning his membership of the Executive Committee because he is under orders to proceed to India and Mesopotamia at the end of the present month. The communication was received with keen regret and the Chairman was asked to convey to Sir John the Committee's high appreciation of his services to the Fund.

## An Arrest.

The *Daily Telegraph* of May 23rd says that on the arrival of the Anchor liner *Elysia* at Montreal on the 22nd, Lieut. Robert Domley Ward-James was arrested, charged with stealing £720, the property of the British Air Ministry. Ward-James had just sent a large quantity of luggage to a Montreal hotel when the detectives arrived. He pleaded not guilty before a Judge. Arrangements have been made for the return of the prisoner to England.

It is understood that Mr. James was a Stores-Accounts officer and made a speciality of preaching discipline and esprit-de-corps.

There seems a probability that in consequence of this incident there may be an investigation into the affairs of other officers who have come into the R.A.F. with flying rank by way of Ruislip and a course of ledger-keeping.

## The Amphibian.

Gosport have produced a Station Magazine which is interesting, even though it does not strive after any startling originality. One of the best things in it is the story of the adventures of ten Sopwith Cuckoos. The somewhat sanguinary adventures of their pilots are gloriously illustrated. Particularly pleasing is the expression on the face of No. 3 who is being removed, protesting, by a benevolent and muscular female angel, to Heaven. One also liked the O.C. and dog throttling No. 9.

An article on Major Mannock, V.C. and his methods in war, a photograph of the already famous Gosport Tug-of-War team and plenty of sports news combine to make a good paper, and one which will prove of considerable interest to the R.A.F. past and present who know Gosport. The editor and staff are to be congratulated.

## R.A.F. SPORTS AND PASTIMES.

## An R.A.F. Club Cricket Week.

After a considerable amount of spade work two members of the R.A.F. Club have succeeded in getting the Committee of the Club to agree to the suggestion that the R.A.F. Club should begin to assert its undoubted superiority in cricket, as in other branches of sport, and a sub-committee has been appointed to organise a Cricket Week on the lines of the Scarborough Festival.

It is understood that H.R.H. the Duke of York, K.G., has promised to lend the distinction of his patronage to the week, as has also the Chief of the Air Staff, Air Marshal Sir Hugh Trenchard.

It is expected that the week will be held at either Eastbourne, Hastings or Birmingham—probably the former—and two three-day matches will be played, one versus the touring side of the M.C.C., leaving for the South African Test Tour, and another match to be arranged. No better fixture than that already secured can be imagined.

The R.A.F. Club should be able to command a useful team when one remembers that the Club membership includes P. G. H. Fender (Captain of Surrey), Hon. F. S. G. Calthorpe (Captain of Warwick), A. H. Gilligan (Captain of Sussex) and S. L. Amor of Somerset, to mention but a few; and that of the two or three ex-R.A.F. professionals that will be played for the Club side, Hobbs, Woolley and Strudwick will probably be included.

The week will probably begin on September 18th or earlier if this date is inconvenient to the South African side.

The present sub-committee dealing with the matter consists of: Air Commodore F. C. Halahan, P. G. H. Fender, Major W. G. Young and Captain M. G. Kidd (Hon. Sec.). Any communications should be addressed to the last-named at 24, Denison House, 296, Vauxhall Bridge Road, S.W.1. (Phone Victoria 2112). Full particulars will be published at an early date.

## Flowerdown.

RUGBY.—Flowerdown has had a most satisfactory Rugger season, as can be seen from the following summary of results:—1st XV. Played 21, Won 17, Lost 3, Drew 1—326 points for 78 against; A XV. Played 4, Won 3, Lost 1, Drew 0—59 points for 14 against; 2nd XV. Played 11, Won 6, Lost 5, Drew 0—137 points for 103 against.

At the conclusion of the season an inter-hut rugger competition was organised, with the result that the station can now boast of no less than 16 complete rugger teams! In this competition none of the Station 1st XV. were allowed to play. Considering that, on an average, 12 out of each XV. had never played before, the keenness in the competition was extraordinary, and the improvement in the standard of play in each team after it had taken part in one or two matches, most remarkable.

The final was played on May 8th amid great excitement, B4 hut defeating C5 hut by 11 points to nil after a very keen game.

## Uxbridge.

CRICKET.—In the first match of the season the Depot XI. played North London 2nd XI. The R.A.F. scored 210 for 3 wickets and North London 162 for 8. F/Lt. Clarke made 99 and F/Lt. Wigglesworth 42 not out. F/Lt. Walker took 5 wickets for 45 runs.

On May 15th the Sergeants' Mess played the Depot 2nd XI., the latter winning by 123 runs to 70. For the Sergeants F/Sgt. Coates made the top score and was brilliantly caught out by AC. Marks. For the winners L/AC. Woods made 53 and AC. Stonebank 33 not out.



# COMMERCIAL AERONAUTICS.

## AND CIVIL AERIAL TRANSPORT.

### THE UNITED KINGDOM OF GREAT BRITAIN AND IRELAND.

#### CONTINENTAL ARRIVALS AND DEPARTURES.

[The following table of arrivals at and departures from the British Air Ports is compiled on the following system:—First comes the initials of the Air Line; next the type of machine; next the international number of the machine; next the ports of departure and destination; next the times of departure and arrival; next the cargo, whether goods (G) and/or mails (M); next the number of passengers; and finally the name of the pilot and number of mechanics, if any.]

ABBREVIATIONS:—A.D.—Aircraft Disposal Co. B.A.—Berkshire Aviation Co. B.C.—Bristol Aeroplane Co. C.A.—Department of Civil Aviation. D.A.—Daimler Airway. D.H.—De Havilland Aircraft Co. G.E.—Compagnie des Grands Express Aériens. H.P.—Handley Page Transport Ltd. I.L.—Instone Air Line K.L.—Koninklijke Luchtvaart Maatschappij. L.A.—Leatherhead Aviation Services M.A.—Messageries Aériennes M.W.—Marconi Wireless Telegraph Co. Ltd. P.O.—Privately owned. P.L.—Peters Ltd. S.F.—Surrey Flying Services S.N.—Syndicat National pour l'Etude des Transports Aériens (S.N.E.T.A.).

The London Terminal Aerodrome, Croydon. (Telephone: Croydon 2720.)

#### MAY 16th:

M.A., Breguet, F-CAK, London-Paris, 05.25-07.53, G., Nil, Delage.  
D.A., DH34, G-EABW, London-Paris, 05.20-07.50, G., Nil, Bradley.  
D.A., DH34, G-EABW, London-Paris, 05.20-07.50, G., Nil, Robertson & I.  
K.L., Fokker, H-NABO, Ldn-Adm, 05.50-12.14, G.M., Nil, Geyssendorfer.  
I.L., DH18, G-EARO, London-Brussels, 12.02-14.24, G., Courtney.  
H.P., DH18, G-EAWW, London-Paris, 12.14-14.45, G.M., 3, Carter.  
M.A., Spad, F-ADAF, London-Paris, 13.00-15.32, G., Nil, Robyn.  
K.L., Fokker, H-NABN, Ldn-Adm, 13.55-16.21, Nil, Nil, Wanaar.  
G.E., Goliath, F-ADDT, London-Paris, 14.07-17.00, G., 2, Rissur.  
D.A., DH34, G-EABW, London-Paris, 15.07-17.20, G., Nil, Hinchiffe.  
I.L., DH18, G-EAWW, London-Paris, 15.07-17.25, G.M., 3, Holmes.  
M.A., Spad, F-ACME, London-Paris, 06.10-09.27, G.M., Nil, Paille.  
K.L., Fokker, H-NABD, Ldn-Adm, 10.36-13.50, G.M., Nil, Silhms.  
I.L., DH18, G-EARO, London-Paris, 11.00-14.39, G., Nil, Roddy.  
D.A., DH34, G-EABW, Paris-London, 11.30-13.49, Nil, 3, Hinchiffe.  
G.E., Goliath, F-GEAO, Paris-London, 11.42-14.23, G., 3, Gaston.  
H.P., WS, G-EABW, London-Paris, 12.54-15.15, G., Nil, Hinchiffe & I.  
M.A., Goliath, F-ADAY, Ldn-Paris, 13.25-15.51, G.M., Nil, Charpentier.  
K.L., Fokker, H-NABD, Ldn-Adm, 14.20-17.35, G.M., 1, Van der Hoop.  
I.L., DH14, G-EBBB, Brussels-London, 16.01-18.35, Nil, 6, Barnard.  
D.A., DH34, G-EBBB, Brussels-London, 18.00-20.35, Nil, Nil, Robertson.

#### MAY 16th:

I.L., DH34, G-EBBB, London-Paris, 05.20-08.02, G., Nil, Jones.  
M.A., Breguet, F-ADAT, London-Paris, 05.28-08.09, G., Nil, Perignon.  
D.A., DH34, G-EABW, London-Paris, 05.28-08.09, G., Nil, Herne & I.  
K.L., Fokker, H-NABK, Ldn-Adm, 05.35-12.23, G.M., Nil, Silhms.  
H.P., WS, G-EABW, London-Paris, 12.19-15.02, G.M., 9, Olley & I.  
I.L., DH34, G-EABW, London-Paris, 12.19-15.02, G., Nil, Herne & I.  
M.A., Spad, F-ADBH, Ldn-Paris, 13.10-16.06, G., 3, Morin.  
D.A., DH34, G-EBBB, London-Paris, 13.10-15.27, Nil, 1, Robinson & I.  
G.E., Goliath, F-GEAC, London-Paris, 13.50-17.35, Nil, Nil, Favre & I.  
G.E., Goliath, F-GEAO, London-Paris, 13.50-18.25, G., 2, Gaston & I.  
K.L., Fokker, H-NABD, Ldn-Adm, 14.00-16.19, G., 1, Wanaar.  
D.A., DH34, G-EABW, London-Paris, 14.57-17.05, Nil, Nil, Hinchiffe & I.  
I.L., DH18, G-EABW, London-Paris, 15.00-17.55, G., Nil, Robins.  
I.L., DH18, G-EAWW, Paris-London, 09.25-11.44, Nil, Nil, Holmes.  
K.L., Fokker, H-NABM, Ldn-Adm, 10.28-13.30, G., Nil, Geyssendorfer.  
I.L., DH34, G-EBBB, Paris-London, 11.17-15.23, G., 1, Jones.  
I.L., DH18, G-EARO, Brussels-London, 11.00-14.39, G., Nil, Courtney.  
G.E., Goliath, F-ADDT, Paris-London, 12.00-14.36, G., 4, Grassett & I.  
H.P., DH18, G-EAWW, Paris-London, 12.05-14.42, Nil, 7, Carter.  
D.A., DH34, G-EABW, London-Paris, 12.06-14.29, Nil, 1, Hinchiffe.  
M.A., Goliath, F-FARI, Paris-London, 13.35-16.44, G.M., Nil, Dorr & I.  
K.L., Fokker, H-NABO, Ldn-Adm, 14.26-17.51, G.M., 1, Hofstra.  
I.L., DH34, G-EABW, London-Paris, 16.10-19.21, G.M., 3, Robins.  
D.A., DH34, G-EBBB, Paris-London, 16.20-18.42, Nil, 3, Robinson & I.  
D.A., DH34, G-EBBB, Paris-London, 18.53-21.14, Nil, 2, Herne & I.

#### MAY 17th:

I.L., DH18, G-EAWW, London-Paris, 05.40-08.20, G., Nil, Shepperson.  
M.A., Spad, F-ACME, London-Paris, 05.40-08.20, G., Nil, Paille.  
K.L., Fokker, H-NABO, Ldn-Adm, 10.30-13.00, G., 2, Robinson & I.  
I.L., DH34, G-EARO, London-Paris, 12.44-12.14/20th, G.M., 1, Bradley.  
M.A., Breguet, F-CAK, Paris-London, 06.00-08.23, G.M., Nil, Portal.  
I.L., DH18, G-EAWW, Paris-London, 11.39-13.58, G., 6, Shepperson.

#### MAY 18th:

I.L., DH18, G-EAWW, London-Paris, 05.11-07.50, G., Nil, Courtney.  
M.A., Breguet, F-CAK, London-Paris, 05.30-08.15, G., Nil, Portal.  
H.P., DH14, G-EAWW, London-Paris, 06.00-10.20, Nil, 2, Carter.  
I.L., DH14, G-EABW, London-Paris, 10.30-11.00, G., 2, Robinson & I.  
K.L., Fokker, H-NABM, Ldn-Adm, 09.50-12.19, G.M., 1, Van der Hoop.  
D.H., DH3, G-EAYU, London-Paris, 10.10-12.44, G., 1, Cobham.  
I.L., DH34, G-EBBT, London-Paris, 11.51-14.39, G.M., 6, Jones.  
I.L., DH14, G-EBBB, London-Brussels, 11.52-13.55, G.M., 3, Powell.  
D.A., DH18, G-EBBB, London-Paris, 12.45-15.00, G., 2, Robertson & I.  
M.A., Goliath, F-ADAY, Ldn-Paris, 13.15-17.35, G., Nil, Charpentier & I.  
K.L., Fokker, H-NABO, Ldn-Adm, 13.50-16.21, G., Nil, Geyssendorfer.  
H.P., DH18, G-EABW, Paris-London, 14.07-16.05, G.M., 8, McIntosh & I.  
M.A., Spad, F-ACMI, London-Paris, 14.26-17.20, G., 1, Revenue.  
D.A., DH34, G-EBBB, London-Paris, 14.36-16.46, G., 4, Hinchiffe & I.  
M.A., Spad, F-ACMI, Paris-London, 16.00-19.29, G.M., Nil, Revenue.  
K.L., Fokker, H-NABN, Ldn-Adm, 10.38-14.30, G.M., Nil, Paille.  
I.L., DH18, G-EAWW, Paris-London, 11.17-15.30, G., Nil, Courtney.  
D.A., DH34, G-EBBB, London-Brussels, 11.52-13.55, G.M., 3, Hinchiffe & I.  
H.P., WS, G-EABW, Paris-London, 12.35-15.24, G., 7, Olley & I.  
M.A., Goliath, F-ADCA, Paris-London, 13.34-17.00, G.M., 3, Chailoux & I.  
D.A., DH34, G-EABW, Paris-London, 15.45-18.05, Nil, 1, Herne & I.  
I.L., DH18, G-EARO, London-Paris, 16.12-19.07, Nil, Nil, Bradley.  
M.A., Spad, F-ADAF, Paris-London, 16.16-19.27, G., Nil, Briere.

I.L., DH34, G-EBBB, Brussels-London, 16.16-19.16, G., 1, Robins.  
I.L., DH34, G-EBBT, Paris-London, 16.25-19.05, G., 2, Jones.

#### MAY 19th:

M.A., Spad, F-ADAF, London-Paris, 05.16-08.20, G., Nil, Briere.  
I.L., DH18, G-EARO, London-Paris, 06.02-08.45, G., Nil, Courtney.  
D.A., DH34, G-EBBB, London-Paris, 06.35-11.15, M., 3, Robertson & I.  
M.A., Breguet, F-CAK, Paris-Ldn, 06.15-13.55/20th, G.M., Nil, Dondin.

#### MAY 20th:

I.L., DH18, G-EAWW, London-Paris, 06.35-18.21, G., 1, Holmes.  
M.A., Goliath, F-ADCA, Ldn-Paris, 08.45-15.55, G., Nil, Chailoux & I.  
D.A., DH34, G-EABW, London-Paris, 10.30-13.00, G., 2, Robinson & I.  
K.L., Fokker, H-NABN, Ldn-Adm, 09.50-12.24, G.M., 1, Pyl.  
I.L., DH14, G-EBBB, London-Paris, 13.33-16.17, G.M., 6, Shepperson.  
D.A., DH34, G-EBBT, London-Paris, 14.28-16.46, G., 7, Herne & I.  
G.E., Goliath, F-ADDT, London-Paris, 14.40-17.53, G., 8, Grassett & I.  
M.A., Goliath, F-FARI, London-Paris, 14.43-17.00, G., 5, Dorr & I.  
M.A., Spad, F-ACMI, Paris-London, 05.50-07.36/21st, G.M., Nil, Robyn.  
K.L., Fokker, H-NABD, Ldn-Adm, 10.53-14.23, G.M., 1, Geyssendorfer.  
M.A., Goliath, F-ADAY, Paris-London, 13.15-17.47, G., Nil, Le Sec & I.  
K.L., Fokker, H-NABD, Ldn-Adm, 16.47-19.55, G.M., Nil, Van der Hoop.  
I.L., DH18, G-EARO, Paris-London, 16.55-19.49, G., 4, Courtney.  
D.A., DH14, G-EBBB, Paris-London, 17.25-19.59, G., Nil, Robinson & I.  
D.A., DH34, G-EBBB, Paris-London, 17.27-19.49, Nil, Nil, Robertson & I.

#### MAY 21st:

H.P., DH18, G-EAWW, London-Paris, 10.30-13.55, Nil, 5, Olley.  
I.L., DH18, G-EARO, London-Brussels, 11.37-14.29, G.M., Nil, Robins.  
D.A., DH34, G-EBBB, London-Paris, 10.53-13.29, Nil, Nil, Robertson & I.  
I.L., DH14, G-EBBT, London-Paris, 11.42-14.39, G.M., 4, Bradley.  
M.A., Breguet, F-CAK, London-Paris, 16.00-16.20, Nil, Nil, Dondin.  
M.A., Goliath, F-ADAY, London-Paris, 13.06-16.44, G., Nil, Le Sec.  
M.A., Breguet, F-ADBT, Paris-London, 07.50-10.29, G., Nil, Revenue.  
I.L., DH18, G-EABW, Paris-London, 11.30-13.45, Nil, 1, Herne & I.  
I.L., DH18, G-EAWW, Paris-London, 11.30-13.49, G., 5, Holmes.  
H.P., DH14, G-EBBB, Paris-London, 11.39-14.49, Nil, 4, Shepperson.  
H.P., DH14, G-EABT, Paris-London, 11.50-14.45, G., 3, McIntosh & I.  
M.A., Spad, F-ACMI, Paris-London, 13.00-16.20, Nil, 3, Robinson & I.  
I.L., Westland, G-EARF, Brussels-London, 13.06-15.39, G., 3, Powell.  
D.A., DH14, G-EAWW, Paris-London, 13.50-16.00, Nil, Nil, Carter.  
D.A., DH14, G-EABW, Paris-London, 14.00-16.01, Nil, 3, Robertson & I.  
I.L., DH34, G-EBBT, Paris-London, 16.10-18.32, Nil, 7, Bradley.  
I.L., DH18, G-EARO, Brussels-London, 16.30-18.56, Nil, 6, Robins.  
I.L., DH4, G-EAMU, London-Irce, 17.47-19, Nil, 2, Keys.

#### Flying by the Aircraft Disposal Co.

May 19th.—Nil.  
May 16th.—D.H.9, test (Stocken).  
May 17th.—Nil.  
May 18th.—D.H.9, test (Stocken).  
May 19th.—D.H.9, test (Stocken).  
May 20th.—D.H.9, tests (Stocken).  
May 21st.—D.H.9, tests (Norwegian pilot).

#### Inland Flying at Croydon.

May 19th.—D.A., DH34, to Stag Lane (Robinson)/S.F., Avro, joy-rides (Muir); K.L., Fokker, test (Silhms).  
May 16th.—I.L., DH34, test (Powell); H.P., W.S., test (Olley and McIntosh); I.L., Westland, test (Keys); S.F., Avro, joy-rides (Muir); M.W., Avro, test (Shaw).  
May 17th.—S.F., Avro, joy-rides (Muir).  
May 18th.—S.F., Avro, joy-rides (Muir).  
May 19th.—I.L., DH34, tests (Barnard).  
May 20th.—D.A., DH34, from Stag Lane — R.A.C., Avro, Brooklands records; S.F., Avro, joy-rides (Muir); P., Avro, from Penhurst (Leavey); I.L., DH4, test (Keys); R.A.C., Avro, joy-rides (Hemming).  
May 21st.—I.L., D.H.8, tests (Keys); S.F., Avro, joy-rides (Muir).

#### Cross-Channel Statistics.

Week ending May 21st:—  
Machines, 114; Passengers, 215; Crews, 186; Total Personnel, 401  
Corresponding week last year:—  
Machines, 75; Passengers, 139; Crews, 100; Total Personnel, 320  
Corresponding week, 1920:—  
Machines, 82; Passengers, 103; Crews, 87; Total Personnel, 190



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*Alan J. Cobham*

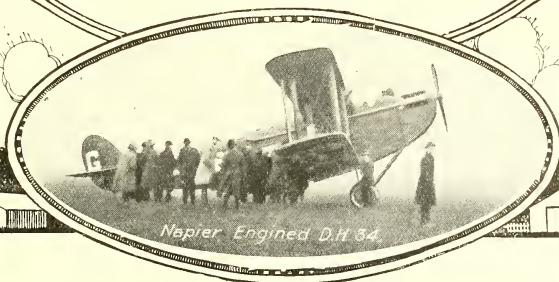
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14, New Burlington Street,  
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Mr. Alan J. Cobham was an early member of the R.F.C. and his ability soon brought him to the fore.

In 1919, as partner in an Aviation Company, he personally carried 8,000 passengers on tours.

For the last two years Mr. Cobham has been engaged with the De Havilland Aircraft Co. as chief test pilot. Has conducted many long flights, including one to Scandinavia, Poland, Italy, etc. He has recently returned from a long tour across Europe, covering 6,000 miles.

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England to SOUTH AFRICA...	628½ miles...	Vickers Commercial Aeroplane.	Rolls-Royce "Eagle" Engines
England to SWEDEN (and back)	...2450 miles...	F5 Flying Boat	Rolls-Royce "Eagle" Engines
England to ... CONSTANTINOPLE	...2160 miles...	Handley Page Aeroplane	Rolls-Royce "Eagle" Engines
England to FINLAND	...1100 miles...	F5 Flying Boat	Rolls-Royce "Eagle" Engines
England to MADRID	... 855 miles...	D.H.4 Aeroplane	Rolls-Royce "Eagle" Engine
England to WARSAW	... 1050 miles...	Handley Page Aeroplane	Rolls-Royce "Eagle" Engine

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# AERONAUTICAL ENGINEERING

SUPPLEMENT TO "THE AEROPLANE"

INCORPORATING AIRCRAFT ENGINEERING AERODYNAMICS, AIRCRAFT FINANCE AND COMMERCIAL AERONAUTICS AND MATTERS PERTAINING TO THE AERONAUTICAL ENGINEER AND THE AIRCRAFT TRADER.

## THE WEEKLY COMMENTARY.

An article by one "Dynamikos" deals with the possibility of still further improvement in the wireless equipment of commercial aircraft and laments the indifference displayed by many aircraft concerns in regard to this matter.

In connection with this article, the abstract of a paper on "Wireless for Transport Services" read by Capt. Sankey before the Institute of Transport, and a note upon an Air Ministry announcement that wireless Direction

Finding facilities from Croydon and Pulham are now available continuously during flying hours are of interest.

The programmes of both the German and the French soaring flight contests for the summer of 1922 are given in this issue. Though the motive is easily understandable, it must be regarded as unfortunate that the French meeting in the Auvergne should clash with the German Rhön meeting.

## UNDEVELOPED POSSIBILITIES OF WIRELESS FOR COMMERCIAL AEROPLANES.

By DYNAMIKOS.

In view of the enormous advance that was made in the development of wireless telegraphy and telephony for aircraft purposes during the War, one cannot help wondering why commercial aircraft companies have not yet begun to reap some real benefit from the practical developments associated with that progress.

I fail to derive much enlightenment on the matter from the latest half-yearly report issued by the Air Ministry. I am happy to note, of course, that "the value of wireless communication between the air and the ground was further demonstrated during the race-weeks at Epsom and Ascot, and the Royal Air Force pageant at Hendon, when airships were employed to assist the police in regulating road traffic."

I am also delighted to know that "experiments have been carried out, and are being continued, with satisfactory results, to determine the possibilities of radio-telephony as a means of directing aircraft into an aerodrome which is invisible to the pilot owing to fog or mist." Further, I am enchanted to learn that "the problem of facilitating night flying has been further investigated." I have, in fact, been transported into realms of purest ecstasy by similar announcements during the past two years.

Hence I may be excused for pointing out in my usual graceful manner that it is high time the Air Ministry cut the cackle about demonstrations and investigations on the existing organisation, and that civil aviation companies cut their losses on ditto and set about doing a little quiet investigating for themselves in a business-like manner.

There are, of course, certain difficulties to be overcome in the matter. The spectre of monopoly, for instance, looms up large. This country is not overcrowded with manufacturers of aircraft wireless equipment. As a result, civil aviation has been lured into the regrettable position of having to "take what was offered" during the past two years in the way of wireless apparatus. This problem, though serious, is not insuperable, however.

One of the most important ways in which wireless could be of service to commercial aviation is in the development of a really reliable method of navigating machines by means of direction-finding instruments. Yet the facilities afforded to commercial machines to-day for navigating by wireless embody none of the improvements that were made in the design of special direction-finding apparatus for aircraft during the War.

Commercial transport companies of course may grudge the small amount of extra space necessary for the equipment of the most efficient direction-finding installation. But I venture to suggest that in some cases the explanation is much more likely to be that they grudge the small amount of extra thinking that an intelligent treatment of the problem demands.

For this reason I propose to call attention from time to time to some novel features of wireless equipment for aircraft which I hope will have the effect, somehow, some time,

of making someone, somewhere, sit up and take notice. The following is a brief description of a method of directing aircraft by wireless telegraphy invented by Mr. E. R. Clarke during the War. If it is not an ideal system for commercial purposes, at least it suggests an interesting avenue for practical investigation.

A wireless station capable of transmitting signals on a suitably low "aircraft" wave is provided at the home aerodrome. On the aircraft a single directive loop aerial is installed, which is tuned to the same wave-length, and is fitted to the usual receiving and magnifying gear. This loop aerial is in the form of a rectangle with vertical sides and its plane is, normally, at right angles to the fore and aft line of the machine.

The centre portion of the loop is (preferably) fixed and stationary, whilst the two outside portions are capable of being rotated about a vertical axis in such a manner that when the right-hand portion of the loop moves forward the left-hand portion moves backward. Now when the plane of this aerial is perpendicular to the line joining it and the transmitting station signals will be zero. As the plane of the aerial is gradually swung out of this perpendicular relation signals increase in strength.

A compass (preferably of the gyro type) is fitted on the machine. In addition to the usual lubber mark in the fore and aft line of the aircraft, this compass is provided with another movable mark known as the "aerial" mark. This is connected with the controls which rotate the extremities of the aerial in such a way that if the effective plane of the aerial is moved through a certain angle to the right, the "aerial" mark is moved through a similar angle, around the compass, to the right.

This system operates as follows: When the aerial is at the position for zero signals, the direction of the base transmitting station will be indicated by the position of the aerial mark on the compass. On leaving the base, the pilot's (or navigator's) aim will be to maintain a course coincident with the direction of zero signals. In the event of a side wind causing the machine to drift from its course, however, it will be necessary to point his machine at a certain angle up wind. The compass readings will indicate the extent of this angle of drift, it being the angle between the lubber mark and the "aerial" mark when the course is such that this angle is constant.

The expert will, of course, see a number of practical difficulties in the way of introducing this theoretically simple method of aerial navigation for commercial purposes. But the function of the expert is not confined to merely seeing difficulties. In the commercial world, at any rate, his business is to get on with the job and conquer difficulties. And I do not doubt that there will be plenty of sound, practical wireless engineers available when commercial firms awaken to the possibilities of an intelligently conducted wireless organisation.

## GERMAN SOARING CONTESTS OF 1922.

It is rumoured that the construction of soaring machines in Germany will become a regular industry, and that several firms are about to take an interest in this branch of aviation. It is rumoured that the Albatros Company is negotiating for the right to build one of the successful German soaring machines, and that other concerns are likely to follow their lead. This industrial interest is said to be largely due to the prize of 100,000 marks which has been offered by the "Verband Deutscher Luftfahrzeug Industrieller," of Berlin.

The prize may be competed for at any time between April 1st and October 31st of this year. It is open only to machines built by Germans and piloted by Germans. To gain the prize it is necessary that the machine, carrying at least one man, should fly for a minimum of 40 minutes, and after that period shall fly over the region of the take-off, against the wind, between two posts 100 metres apart. After passing the post the machine is required to cover five kilometres in a straight line before landing. The prize will be awarded to the machine which completes these tests in a flight of the maximum duration. Competitors are free to choose the locality for their flights, which may be made over land or water.

The commission responsible for making the awards will be set up by the "Wissenschaftliche Gesellschaft für Luftfahrt" (the equivalent of the British Royal Aeronautical Society), who, with the aforementioned "Verband" and the German Aero Club, have collaborated in drawing up the rules. It is not thought probable that this prize will be awarded this year, although it is held not to be impossible to achieve the required conditions. There is some feeling that the money would have been better used if it were added to the prize fund of the Rhön contest.

The Rhön competition organised by the "Deutscher Modell und-Segelflugverband," in collaboration with the "Südwest Gruppe des Deutschen Luftfahrer Verbandes," under the patronage of the "Wissenschaftliche Gesellschaft für Luftfahrt" takes place between Aug. 9th and Aug. 24th, with a possible extension to Aug. 31st. It will take place as before at the Wasserkuppe or its immediate vicinity. This contest is open to machines and pilots of all nationalities. Machines entered for the contest will be divided into two categories: "Gliders" and "Soarers." For competition purposes a "glider" is a machine which has shown a test flight of a minimum of 30 metres' distance and 30 seconds' duration. A "soarer" is a machine which has made a test flight of at least 600 metres and 60 seconds, and showing a maximum rate of fall of not more than 1.5 metres per second. The qualifying tests must be made before the competition. In addition entrants are required to submit certificates as to the strength of their machines, which must be given by authorities acceptable to the "Wissenschaftliche Gesellschaft."

The following prizes are to be awarded:—

For soaring machines:—(1) "Grand Prize of the Rhön," 50,000 marks for the longest duration of a single flight, which is accompanied by a loss of height of not more than 0.2 metres per second. Only flights of more than 10 minutes' duration are admissible.

(2) Prizes of 15,000, 9,000 and 6,000 marks for the lowest rate of fall. Flights of 100 seconds or over are admissible, and for each 100 seconds of flight over the minimum an allowance of 0.01 metres per second will be deducted from the actual rate of fall.

(3) Prizes of 12,000, 6,000 and 4,000 marks for the flights covering the greatest distances.

For Gliders. "Gliders" are divided into two sub-categories, those fitted with proper control surfaces, and those of the Lilienthal type controlled by movements of the pilot.

For the surface controlled type prizes are to be awarded for the best total duration made by the same pilot on the same machine. These prizes are sub-divided into (a) prizes of 6,000, 4,000, 3,000, and 2,000 marks for the total of flights of at least 30 seconds' duration; and (b) prizes of 4,000 and 3,000 marks for the total of flights of 15 seconds' minimum duration confined to pilots who do not hold pilots' certificates for power-driven machines.

There are also prizes for the greatest distance in a single flight; also, similarly sub-divided into (a) prizes of 6,000, 4,000, 3,000 and 2,000 marks open to all pilots; and (b) prize of 3,000 marks for pilots who do not hold power-driven tickets.

For the Lilienthal type gliders prizes of 5,000, 3,000, 2,500, and 1,500 marks for the greatest total duration accumulated in flights of over 15 seconds, made by the same pilot on one or more machines.

Finally, there is a total sum of 18,000 marks at the disposition of the jury to be awarded at their discretion.

These regulations have been the subject of considerable adverse criticism on the ground that they are absurdly complex, that they lead to numerous prizes of little individual value, and that their complexity will seriously detract from the sporting interest of the competition.

It is somewhat curious to note that certificates of the test performances which are to decide whether the machines are "gliders" or "soarers" may be sent in up to August 10th, and that the committee will decide whether entrants fall in one or another category. This Committee, however, has no other function in the scheme of affairs. Thus apparently a competitor may be flying merrily for some time without any knowledge as to whether he "soars" or "glides."

Despite the rules it is hoped that the contest will produce a marked advance in performances.

In addition to the regular Rhön competition of this summer a contest has been arranged for two-seater soaring machines.

The "Deutscher Luftfahrtverband" (the German Air League) has received from certain beneficiaries the sum of 75,000 marks for the encouraging of progress in soaring flight.

The "Deutscher Luftfahrtverband" has in collaboration with the "Wissenschaftliche Gesellschaft für Luftfahrt" (the equivalent of the British Royal Aeronautical Society) and the "Deutscher Modell und Segelflugverband" (German Model and Soaring Flight Association) decided upon the following programme.

The contest, which is to be known as the "Rhön two-seater competition," is to be open from June 1st to Dec. 31st, 1922, and, unlike the regular Rhön contests, is not to be international. The machines entered must be German owned, of German design and construction, and piloted by a German. The competition will be held in the Rhön. Machines are to carry two persons of a minimum total weight of 150 kilograms. They must be provided with control surfaces. (This condition is to rule out Lilienthal type gliders where control is effected by movements of the crew.) They must be capable of being assembled or dissembled by two persons in 15 minutes, and when dissembled must pack into a space of 9.5 metres long by 3 metres square.

The machine ready for flight must be of dimensions not exceeding 15 metres square by 4 metres high. This last condition seems to have received some adverse criticism. Its object is to prevent the entry of machines of exaggerated dimensions, but it is suggested that by putting a definite limit to span and length there is a risk of ruling out good machines having a large span, and making it possible for a machine of enormous area but very poor aerodynamical qualities to carry off the prize.

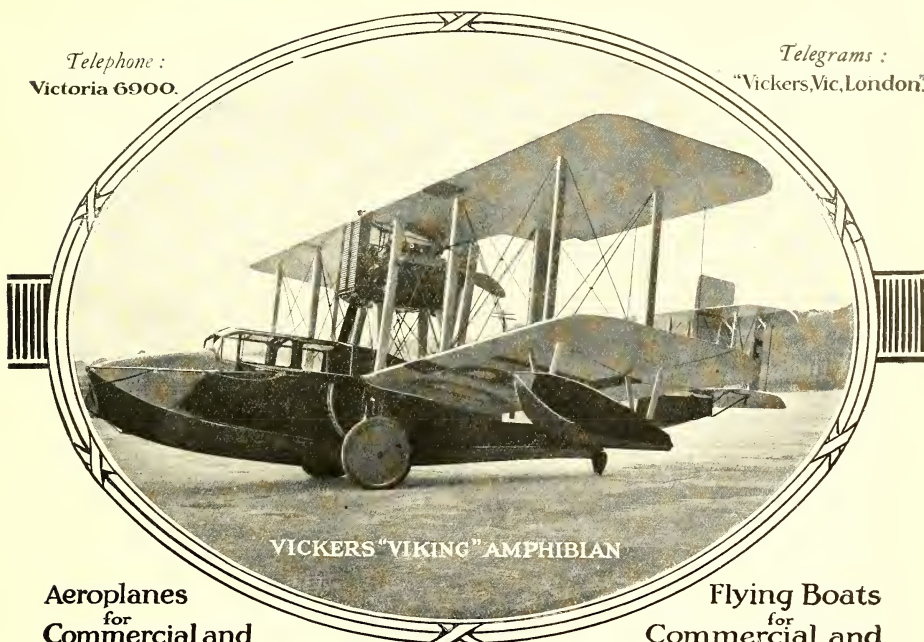


**TWO FAMOUS SOARERS**—At top, the Hannover Glider in the air in the Rhön mountains. Below, Herr Harth, who made a 21-minute flight last year, soaring at Heidelberg in August, 1916.



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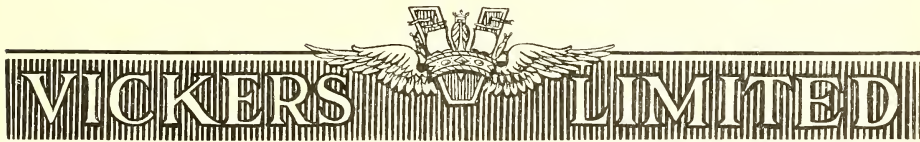
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## THE FRENCH SOARING FLIGHT MEETING.

It is by now fairly well known that a gliding and soaring flight meeting is to be held in France during the coming summer. This meeting, which is to be known as the Premier Congrès Experimental D'Aviation sans Moteur, has been organised by L'Association Française Aérienne and L'Aéro Club d'Auvergne by way of a counter blast to the German Rhön contests, in order that it may not appear that Germany alone appreciates the importance and the interest of soaring and gliding experiments.

The project has been supported by the Under Secretariat of State for Aeronautics and by the Ministry of War, and by many of the most important members of the French Aeronautical world. The list of patrons includes the present Under Secretary for Aeronautics, M. Laurent-Eynac his predecessor, M. E. P. Flaudin, and such well-known persons as MM. Ernest Archdeacon, Louis Bleriot, Louis Breguet, G. Delage (of the Nieuport-Astra Company), Robert Morane, Robert Peugeot, and a number of officials of the French "Section Technique de l'Aéronautique."

The meeting is to be international—ex-enemy subjects alone being barred the competitions. A total of 100,000 francs is available for prizes at the meeting, and in addition the French Aero Club and the Ligue Aéronautique de France have presented a number of trophies. The date of the contest is August 6th to August 20th, thus clashing with the Rhön meeting of August 9th to August 24th, and the site is the Puy de Combergrasse, a hill 1,118 metres above sea level, 22 km. south-west of Clermont Ferrand (Auvergne), which is part of the range to which belongs the well-known Puy de Dôme.

This hill is about 150 metres above the surrounding country, has a flat top of about 40 metres by 20 metres, and falls away from the summit at a slope varying between 1 in 5 and 1 in 8. The easiest slope faces the prevailing west and south westerly winds. Practically the whole surrounding country is suitable for landing, and is covered with either grass, heather, or small broom.

The following is the prize list:—

Prizes of 5,000, 3,000, 1,500 and 1,000 francs, and a silver trophy (awarded by the Aero Club) for the longest duration of single flights. No prize will be awarded for any flight of less than three minutes. Prizes of 5,000, 3,000, 2,000, 1,000 and 500 francs for the greatest aggregate time of flight made during the meeting. Each and any flight, whether made as a demonstration or test flight, may be counted provided that it is made during official hours and exceeds thirty seconds.

Prizes of 10,000 and 5,000 francs, and another silver trophy for the greatest distance covered in a single flight, measured in a straight line from start to finish. Generally these flights are to take place from the Puy de Combergrasse, but the

judges may authorise competitors who desire it to fly from the Puy de Dôme instead, if they are satisfied that the flights made from the normal position justify this course. The minimum qualifying distance is 2 km. from the Puy de Combergrasse and 5 km. from the Puy de Dôme.

Prizes of 5,000, 2,500, 1,500, and 1,000 francs for the slowest speed of descent. For this prize, pilots must indicate before the start their intended landing place, must land within 200 metres thereof, must remain in the air at least two minutes, and must show an average rate of descent of less than 1.5 metres per second.

Prizes of 5,000, 3,000, and 1,500 francs and a silver trophy for the maximum height attained above the starting point. This point is fixed as the summit of the Puy de Combergrasse. The height will be determined by barograph.

Prizes of 2,000, 1,000, and 500 francs for accuracy in landing on a pre-designated spot. The judges will indicate on each day three different landing points—not less than 500 metres from the start. Each pilot must choose one of these three and land as close to it as possible.

Prizes of 3,000 and 2,000 francs for the longest duration between leaving the ground and the last occasion on which the machine falls below the level of the getting-off point.

There are in addition 15 prizes each of 1,000 francs which are at the disposal of the judges for the rewarding of any effort which they feel deserves it. In addition L'Union pour la Sécurité en Aéroplane have available 10,000 francs which may be awarded for any arrangement demonstrated at the contest which makes for the safety of air travel. The decision as to the use of this sum will be made by a delegation from L'Union pour la Sécurité which will attend.

In addition flights may be made for the René Quintan Prize—which, however, may be competed for elsewhere. The rules for this contest are not, however, yet available.

Entries may be made to the Secrétariat Général de l'Association Française Aérienne, at 17, Boulevard des Batignolles, Paris. Up to May 31st the entrance fee is 50 francs per machine entered. From June to July 15th the entrance fee is raised to 100 francs. These fees will be returned to entrants who actually take part in the contest.

Very complete arrangements are promised for the transport to and from the competition of machines and their personnel at reduced rates, for the housing of machines, competitors and visitors, facilities for repair, etc., and for communications with the town of Clermont Ferrand.

The fullest information as to the rules and the arrangements made are published by L'Association Française Aérienne, and can be obtained at the address given above. The meeting will be held in open country and there are no enclosures or charges for admission to the scene of the contest, which takes place in the middle of one of the most romantic provinces of France.

## WIRELESS FOR TRANSPORT SERVICES.

On Wednesday, May 17th, Capt. H. Riall Sankey, C.B., C.B.E., R.E., read a paper before the Congress of the Institute of Transport on "Wireless as an Aid to Transport." This paper, which gives a short account of the applications of wireless telegraphy and telephony to transport by sea, air and land, should suffice to convince any who may be doubtful as to the utility of wireless that the continued development of aircraft wireless is essential if Air Transport is to become safe and reliable.

The paper points out that it was as recently as 1901 that the first steamship, the *Lake Champlain*, was fitted with wireless, and that since then the value of this method of communication has been so abundantly established that to-day all civilized Governments have made it compulsory for ships carrying more than a certain number of souls to be equipped therewith. The direct ground of this compulsion is of course the security of crews and passengers in the event of accident due to the possibility of rapidly calling for assistance from other ships in the vicinity but well outside the range of visibility. The case of the *Titanic*, which struck an iceberg in mid-Atlantic over ten years ago, and successfully summoned by wireless assistance which was able to rescue over 700 of her complement, may be regarded as the outstanding proof of the importance and value of this use of wireless.

Beyond this direct application of wireless to life saving there are numerous subsidiary uses to which it may be put at sea which all tend to increased security. These uses are:—

(a) The transmission of accurate time signals, which permits the checking of ships' chronometers, and so makes for accuracy of navigation by astronomical methods. (b) The collection and distribution of meteorological information, both from shore stations and from other ships. (c) Direction finding, either by D.F. apparatus on the ship taking bearings of known transmitting stations, or by bearings taken by shore stations and re-transmitted to the ship.

A fourth and new aid to navigation, the so-called "wireless

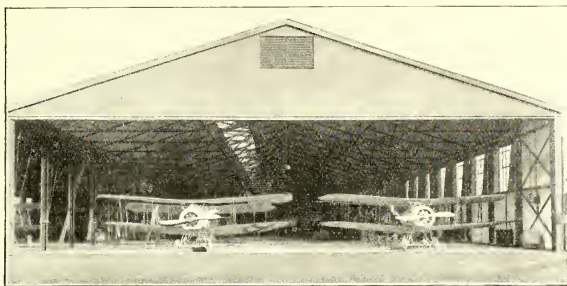
beam," also promises to be of great value to navigation. By a special arrangement of the transmitting station, the so-called "wireless beam" may be transmitted in a definite direction only. The beam may be either fixed, or rotating at a defined rate, and by observation of characteristic signals incorporated in the beam it is possible for a ship station which passes through the beam to discover immediately the exact bearing of the transmitting station. The "wireless beam" therefore serves the purposes of a lighthouse—with the exception that fog forms no hindrance to its usefulness.

The section of the paper dealing with aircraft wireless gives an account of the development of wireless telephony as applied to British commercial air transport, from late in 1919, when the Airco G-EALU and the Handley Page G-EALX were equipped with wireless telephones, until 1921, when all British regular air line machines were fitted with the Marconi A.D.2 set, which has proved so satisfactory, and has often allowed the machines carrying it to keep in touch with Croydon on the whole length of the London-Paris route. It is said that since this set came into use the number of failures has been under five per cent. of the number of flights.

Certain well-known instances of machines so equipped having successfully made the London-Paris journey under conditions of fog which would have rendered the trip impossible without wireless are mentioned.

For land transport wireless has been relatively little used, except for military purposes, and its scope is somewhat restricted.

In connection with Capt. Sankey's list of the uses of wireless at sea, it may be well to point out here that all of them are of interest for aerial purposes. Direction-finding and meteorological services are of course even now used for aerial purposes. When really long distance trans-oceanic services are in operation, the time signal service will be as aerally important as it now is at sea. And the "wireless beam" obviously may prove of very great value to air transport.



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### ROUTINE POSITION FINDING.

Air Ministry "Notice to Airmen," No. 50 of 1922, makes the notification that as from May 17th, 1922, the Croydon and Pulham Wireless Direction Finding stations will keep regular watch during the hours when flying is taking place on the Continental routes, for the purpose of providing pilots with information as to the position of their craft.

The aforementioned notice gives complete information and instructions as to the routine to be adopted, the wave length and the call signs to be used, and all other essential particulars.

As is well known, the system of direction finding from these two stations has been in use for some months, but it has been regarded officially as an experimental essay, and the publication of this notice may therefore be assumed to be an indication that the Air Ministry is now sufficiently satisfied with the working of the system to put it into operation as part of the regular organisation of the Continental route.

The service is also available for machines engaged on inland flights in Great Britain.

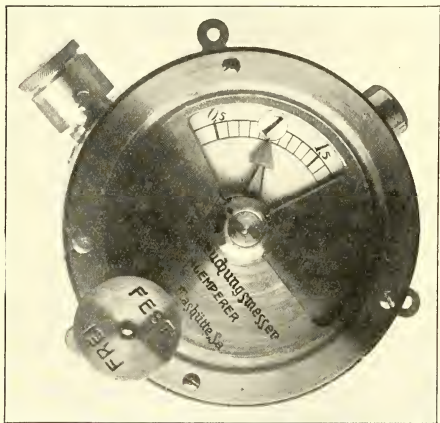
The Air Ministry express the hope that civil pilots will make use of these facilities as a matter of routine, even in fair weather, in order that everyone concerned may become accustomed to the system, and so ensure rapidity and smoothness of working when bad weather makes it of real importance.

### THE KLEMPERER WING LOAD INDICATOR.

The instrument shown in the attached illustration is one developed by Herr Klemperer, the designer of the well-known Aachen gliders. It is a compact form of indicating accelerometer and gives directly in multiples of gravity the intensity of the forces on a mass carried by an aeroplane—or other vehicle—due to acceleration.

It therefore serves to indicate the intensity of loading on the wings of an aeroplane produced by manoeuvres, or atmospheric disturbances. The indications are in plain figures, 1 corresponding to steady flight and the normal loading due to the weight of the machine, 2 to twice that loading, and so on.

The scale rotates past a fixed pointer, and only a small por-



tion of the scale is visible. Part of the scale—that corresponding to dangerous loads—is coloured red, and the appearance of red through the aperture gives the pilot warning that the particular manoeuvre causing that appearance is one subjecting the machine to loads approaching a danger point. Obviously this red portion of the scale can be arranged at any suitable part of the scale to suit machines of varying degrees of strength.

There is nothing novel about this use of an accelerometer, but hitherto this type of instrument has been used only in a form suitable for research work. A clear indicating instrument of this type may be of some value for routine test and demonstration work.

### AN UNUSUAL EVENT.

All aeroplane designers—and some other people—are aware of the distressing habit new aircraft almost invariably possess of exceeding their designer's estimate of the total weight. It is therefore of some interest to record that the first of the Handley Page W.8b type has set an excellent example to all commercial aircraft by turning the scale at several hundreds of pounds below the estimate.

### THE COUPE DEUTSCHE.

It is now announced that the second annual contest for the Coupe Deutsch will take place at Etampes on Sept. 2nd. As regards entries, it is a little early to make any definite statements, but there is certainly a little activity in certain camps that are known to regard aeroplane racing favourably.

In France a Nieuport entry is regarded as certain, and it is said that the "Sicquiplan" is being altered accordingly. The plane surface is being reduced by roughly two square metres, and the power is being increased, but whether by "boosting" or a different power unit is not yet known.

A Hanriot entry is contemplated, but it is not known whether the D.H.22 which was designed for last year's contest, and so far has not flown, or a machine at present being designed, will be used.

It is rumoured that M. Bécheureau, well known as the designer of the Duperdussin monoplane and the earlier Spads, has under construction at the Letord factory, a high-powered fighting Scout. Also, the Etiblissemments Bernard are constructing a high-speed all-metal machine, both presumably for the Aviation Militaire, but there is no reason why either or both should not form the basis for entries from both these firms.

It will be remembered that the Borel racer entered for the last Gordon-Bennett contest was merely their very efficient two-seater fighter fitted with racing wings and embodying some minor refinements as to streamlining, etc. This machine, although it did not compete, showed itself, in flight, to be as fast, if not faster, than the winning machine.

The United States have showed themselves to be highly interested in international speed contests, and a resolution signed by Rear-Admiral Moffatt and Major-Gen. Patrick, the respective chiefs of the U.S. Navy and Army Air Services, was submitted recently to Congress urging official participation in all contests at home and abroad. Also the Aero Club of America have definitely fixed August 15th or thereabouts as the date for elimination trials to be held, if necessary, at Mitchell Field, L.I., should any entries materialise.

At least one entry from Italy is expected, and with the number of Italian competitions that are arranged for this year it is hoped other firms will think it worth while to construct special machines, the qualities of which may warrant their entry for what is generally considered to be the "Blue Riband" of the speed world.

It is hoped that Great Britain will again be represented, at least by the "Bamel," as even with all the prospective "dark-horses" that one occasionally hears of, it is still believed that Mr. Folland has produced the fastest machine in the world. Unfortunately, although his designing powers are supreme, neither he nor his firm have yet evolved the means of extracting the proverbial blood from the ditto gate-post, so that until the "Bamel" is granted a go it must perform be content to rest on its laurels gained at Martlesham last year.

There also seems to be a question of an entry by Fokker, so that taken all round the coming Coupe Deutsch contest will, if all rumours are true, assume a true international aspect.—L. B.

### AIR MINISTRY NOTICE TO GROUND ENGINEERS.

No. 6, 1922.—RE-BALANCING OF PROPELLERS AFTER RE-TIPPING OR RE-PAINTING.

It is hereby notified:—

1. Ground engineers are reminded that when propellers are re-tipped or even re-painted, it is essential that they be properly re-balanced before being replaced on aircraft.
2. Such re-balancing can easily be carried out by fitting a metal or hard-wood plug into the boss of the propeller, such plug carrying a 1/4 in. diameter steel spindle, which is in turn supported by two knife edges. The propeller should be balanced while under test by the application of additional paint or varnish as may be necessary.

Air Ministry, May 15th, 1922.

### ORDERS FOR ITALY.

It has been reported that the Ansaldo firm have recently received orders for 20 Ansaldo 300-h.p. biplanes from Poland, and 100 S.V.A. and 300-h.p. Ansaldo biplanes from Bolshevik Russia. All these machines will be delivered by air by Italian pilots.—A. B.

### MR. PETTER ON INDIAN OPPORTUNITIES.

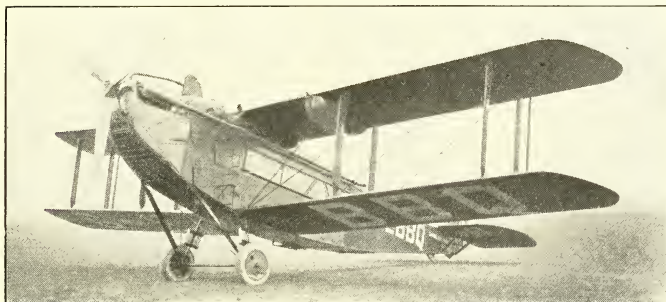
Mr. E. W. Petter, chairman of the Executive of the British Engineers' Association, and managing director of Petters Ltd., has just returned from an extensive tour of India. He expresses himself as greatly impressed by the very great opportunities which exist for the development of industry in that country, but that there is a very great deal of industrial activity in India itself which renders British competition with native products extremely difficult. There are also serious social and economic grievances, which make the task less easy.

Nevertheless India, like the rest of the Empire, presents great opportunities, and this generation will in the future be judged by the uses it makes of those opportunities.



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### The London Terminal Aerodrome.

During the past week Captain Stocken has been putting through their paces numerous not-quite-standard D.H.9s for a foreign customer. It is now permitted to state that these machines differ from the standard D.H.9 in that they are fitted with 260 h.p. Mercedes engines of German make, which engines were specified in the order of the foreign gentleman in question. And very pretty jobs they are.

The D.H.9 on which Major Wilfred Blake hopes to be flown part of the way round the world was nearing completion when last seen, and the said Wilfred hopes to be started to-day. Competent pilots who intend to start on the flight next year with proper organisation do not attach much importance to the present venture, although they are aware that given proper organisation and a special machine Mr. Norman MacMillan stands as good a chance as any pilot on the job.

Capt. Stocken is taking the D.H.9a which he flew in the Easter Races to Le Bourget for the races on Thursday, Friday and Saturday of this week.

On Monday, Mr. Robinson started off on a Daimler D.H.34 for Paris, and as he was leaving the ground the undercarriage sheared on one side. He was recalled by wireless and told to land at Stag Lane, where the damage already sustained and any damage which might occur on landing could be repaired more easily. As it happened, Mr. Robinson made a beautiful landing without further damage.

The De Havilland Company took the opportunity of fitting the machine with the new 3-ply leading edge and she was flown back to Croydon on Saturday morning.

On Saturday at midday, Mr. Olley started to Paris on a W.8b and a similar thing occurred to him. He was recalled and also landed without further damage. An element of humour was added on this occasion by a dash to the scene of the landing by the new aerodrome fire engine. This would have been more sensational if the great dash had not been made some minutes after the W.8b had landed and the passengers had all been disembarked.

The same machine when starting off on Thursday broke a tail skid in travelling across the aerodrome.

All these mishaps draw attention to the appalling state of the aerodrome surface. It is really quite time that the Air Ministry took steps to level out the ridge the far side of the aerodrome, to the need for the removal of which this paper drew attention two years ago. Also the landing lights and the concrete surrounding them are positively dangerous as some of these actually protrude a matter of several inches.

The French are taking steps to level Le Bourget and it is quite time that the Air Ministry took similar action with Croydon.

Were it not for the wireless people at Croydon both the D.H.34 and the W.8b and previously the Bristol 10-seater might all have suffered considerable damage in landing, and one suggests that they should claim salvage money from the insurance companies, who in the case of severe damages to a machine in landing should be able to claim from the Air Ministry for negligence in failing to keep the aerodrome in good and proper condition.

Mr. Barnard returned from Brussels on Monday, the Instone Air Line having successfully carried out the opening ceremony from that end on that day. Mrs. Barnard travelled as a passenger on the machine.

Mr. George Powell took Sir Sefton Branccker, Col. Raikes, Col. Blandy and Mr. F. G. L. Bertram, C.B.E.—who, according to the Air Force list is a "Principal (old style)" of the Air Ministry, in a D.H.34 to Brussels on Thursday and he returned with them in a Westland on Sunday afternoon.

The Instone Air Line are to begin a round service from London to Brussels, Brussels to Paris, and Paris to London in the day, for the benefit of tourists. The Brussels-Paris part of the journey will be made in a French machine by arrangement with a French firm.

On Thursday evening about 9.00 hours Messrs. Robins and Jones on 31s and Mr. Brady on an 18 all came in more or less together, Mr. Brady making one of his "Brighter London" landings.

Earlier in the week Mr. Warnaar, flying a Fokker from Amsterdam to London, got squeezed between the low clouds and the Folkestone hills, and in attempting to land the machine was wrecked. The pilot escaped unhurt and one passenger was somewhat hurt.

On Friday, various important people from the Institute of Transport visited the aerodrome. Mr. Barnard made some flights in a D.H.34 and Capt. Stocken was flying a D.H.9 with Mercedes engine. Many machines were paraded and the "White and the blue elephants" i.e., the Air Ministry's Prize Winners, were brought out for their bi-annual airing and then wheeled back.

It is amusing to consider that these two machines were built especially to the specifications of the Air Ministry's Competitions at Martlesham in 1920, to involve a suitable commercial machine, and were awarded first prize in their respective classes, and lauded by the Ministry up to the skies.

In the third class, the highest award was made to the Handley Page W.8. But the Air Ministry stated that as they did not consider it an efficient machine it would only be given a second prize.

Now the W.8 is the only one of the three that has proved successful in actual practice on the air lines, and with a lower powered engine is even now admitted by all to be among the finest air liners now running.

This is no reflection on the firms concerned who admittedly built their machines for no other purpose than to win the large prize money offered for a foolishly ruled competition.

It should be noted that the particular Department of the Air Ministry which evolved the foolish rules is now under entirely new management.

On Saturday morning Mr. C. D. Barnard left for Trouville on a D.H.9c. Up to Sunday evening no news had been heard of him and considerable anxiety was felt until news was received that he had landed at Le Treport with a cracked cylinder block.

On Saturday Mr. Hayns and oneself flew to Brooklands on a Royal Aero Club Avro to see the motor racing, leaving Brooklands again at 17.55 hours with one cylinder cut out. Doubtless the motor-mongers passed numerous remarks on the noise of the engine, though it did a good deal better than many of the alleged racing cars.

Passing over Sutton at 18.05 we saw the train leaving the station which one intended to catch at Waddon at 18.22 hours. However trains go slower than Avros even when the latter have missing cylinders, and the train was easily reached.

Major Hemming, of Orinoco renown, flew the same machine later in the evening.

Sunday was a busy day again, there being 18 machines to and from the Continent. Furthermore it is a good sign to see that the number of passengers in the machines is steadily increasing.

Mr. Keys was fraternising with a D.H.18 during the afternoon, doing some very good landings, and at about 17.00 hours he left in the Instone D.H.42 for Brest with a Press photographer to get some photographs of the wreck of the P. and O. boat.

Mr. Muir was busy carrying passengers on the Surrey Flying Services' Avro on Saturday and Sunday, and the usual large crowd of spectators was present.

Major Foot brought up the un-Jupitered-re-Rolled O/400 Handley Page from Bristol to Croydon-Week during the week, and Mr. Shaw was reaching colossal altitudes on the Renault Avro belonging to the Wireless people.—G. D.

## AIRCRAFT IN PARLIAMENT

On May 17th in reply to a question by Mr. MALONE addressed to the Prime Minister, Mr. CHAMBERLAIN said that the terms of reference of the Committee composed of the Minister of Health, Lord Weir, Sir A. Williamson, Lt.-Col. the Hon. F. S. Jackson, Sir G. L. Barstow, Sir A. L. Durrant, Major-Gen. Sir F. A. M. Nichol, which is considering the question of amalgamating certain common services, are as follows:—That a technical Committee should be set up at once to make definite proposals for the amalgamation or co-ordination of the common services of the Navy, Army and Air Force, such as intelligence, supply, transport, education, medical, chaplains and any other overlapping Departments.

A separate Committee will investigate the practicability of a Ministry of Defence.

Replying to Sir W. JOYNSON HICKS, Capt. GUEST said that there are no fighting aeroplanes fitted with parachutes. A number of training aeroplanes are so fitted and instruction in the use of parachutes is being given but at present no live drops for practice or experimental purposes are to be made from heavier-than-air craft. About 12 parachute sets have been issued for the equipment of Army aeroplanes, which is the type of aircraft for training purposes. These sets are being used for service trials and recommendations regarding modifications are being received. It is intended to bring them into general use when they have reached a stage of development which warrants the expenditure.

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In a written answer on May 17th in reply to a question by Sir H. BRITAIN, Earl WINTERTON, Under Secretary of State for India, said that no mails are carried by aeroplane in India. The Government of India have decided to prepare an air route from Bombay to Calcutta and Rangoon, and when the route is completed to invite tenders for an air mail service over the completed section or sections. In view of the present financial situation the preparation of the route is likely to be delayed.

Replying to a further question by Sir H. BRITAIN Earl WINTERTON said that he was satisfied that the present provision of funds by the Government of India is sufficient to maintain the full establishment of reserves and spare parts which are necessary to enable the R.A.F. in India adequately to carry out their service.

On May 18th, replying to a question by Mr. BALDWIN KAPER, the SECRETARY OF STATE for AIR said that the total personnel of the Royal Aircraft Establishment is 1,316, of whom 70 represent scientific and technical staff (including R.A.F. officers), 85 clerical staff, 620 skilled mechanics (including apprentices) and 335 labourers and general workers.

Replying to questions put by Mr. KAPER and Mr. MALONE on May 18th Captain GUEST said that he had been in close communication with the Agent General of Tasmania in regard to Commander Burney's proposal for establishing an Imperial Airship Service. Commander Burney has been informed that in the opinion of the Air Council his scheme constitutes a notable advance on previous proposals and if certain additional safeguards are provided it offers reasonable prospect of satisfactory operation between India and this country. This statement is subject to the definite qualification that the commercial success of an undertaking depending upon the regular use of airships must at present be highly speculative. In the event of the scheme being adopted the question of adequate technical control by the Air Ministry will receive full consideration.

#### THE LE BOURGET MEETING.

Among the various events at le Bourget from May 25 to May 28th may be mentioned the following:—Group flying, getting-off competition, landing in confined space, figure-of-eight competition, height contest and landing competition (reserved for military pilots in service machines), the Coupe Léon Bathiat, Prix de Tourisme, Coupe Dubonnet, and the Coupe Lamblin.

The Coupe Léon Bathiat is for military pilots only, and for 1922 consists of a light Paris—Angers—Paris with various

intermediate landing points, indicated to the pilots on their departure. The "objet d'art" will be awarded to the pilot who accomplishes the course in the shortest time, and the squadron or formation to whom the winning pilot belongs, will hold the cup for one year.

The Prix de Tourisme is open to all machines of 60 h.p. or under, and will be awarded in points, these points being allocated for getting off, landing, climb to 1,000 m., maximum speed, minimum speed, ease of dismantling, space taken up in hangar, assembling and getting off.

The Coupe Dubonnet is open to both military and civil pilots, and consists of making six circuits of Le Bourget—Chateau de la Queue—Tremblay-lez-Louvoise—Le Bourget with a landing at Le Bourget to pick up a packet each lap. The cup will be awarded to the firm or squadron entering the machine which makes the six circuits and three landings with the picking up of five postal packets in the shortest time.

The Coupe Lamblin may take place any time between May 25th and October 31st of any year, and for 1922 consists of a circuit Paris—Brussels—London—Paris with compulsory landings at Brussels (Évère) and London (Croydon). Any type of machine may participate and certain handicaps have been arranged for machines of varying horse-power, passenger-capacity, etc. Three special prizes are being awarded to these machines who by May 27th have covered the circuit in the shortest time.

The Coupe Lamblin and three prizes of 10,000, 4,000, and 2,500 francs will be awarded on November 1st, 1922, to the three machines which have made the three best times over the course; and the cup will become the property of the entrant who wins it for three years in succession. In the case where in three years different entrants have won the cup it will be awarded to the one who has made the circuit in the shortest time.



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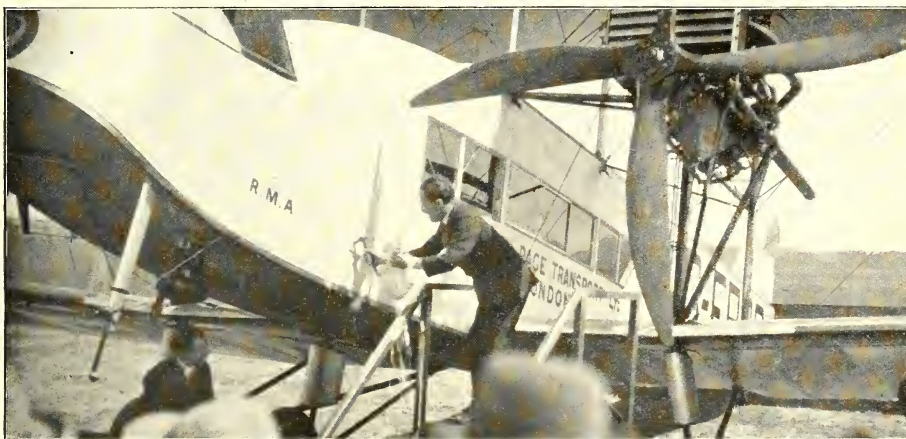
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## THE BAPTISM.



HIS FIRST OFFICIAL ACT. - Major-General Sir Sefton Brancker, the New Director of Civil Aviation, baptising the new Handley Page W.8b. (Rolls-Royce Engines) "Princess Mary" on May 16th. He is here seen after breaking the bottle of champagne and on the point of tearing off the fabric strip which covered the name of the machine.

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## ON UNCOMMERCIAL AND UNCIVIL AVIATION.—I.

Never has that ancient ejaculation "Save us from our friends" been more apposite than in its application to aviation, whether of the so-called commercial brand or of the kind called civil because it is not definitely warlike. All the old proverbs have antidotes in other equally old and respectable proverbs, thus while it is true that "in a multitude of councillors there is wisdom" it is also true that "too many cooks spoil the broth." And so far as non-warlike aviation is concerned it is painfully evident that all the friendly cooks concerned in it have made a more hopeless mess of it than even the political Irish Stew on the other side of St. George's Channel. That at any rate is being left by the Government to slimmer in its own juice, whereas all sorts of people are trying to re-cook civil aviation.

Warlike aviation is doing so much better in every country than is civil aviation primarily because the Air Force of each country is run by one man who, as a rule, knows his job and does it. Which merely exemplifies the fact that a benevolent despotism is the ideal form of Government—at any rate so long as one can assure a succession of benevolent despots. For instance, could anybody imagine the Royal Air Force reaching its present high level of efficiency out of the welter of chaos in which it existed after the Armistice if it had been left to a lot of independent concerns each with a Government subsidy and each more or less permitted to do as it liked subject to a Controller who did not control. Which again shows the folly of democracy, and will help people to understand why all these funny little democratic states in Central Europe will never do any good till they acquire monarchs of some kind.

The quaint working of the democratic mind is shown by an incident which occurred to a certain sportsman once well known among aviators. He owns a wonderful motor-driven yacht and employs a Czecho-Slovak engineer who is a marvel as a mechanic but has a democratic mind. One day when the yacht was new he was taking it into a rather tricky harbour. The engines were thoroughly bad and for the first time after weeks of work the Czech engineer had got them running properly. Also the engine-room telegraph did not work so the owner-skipper was steering the boat and at the same time controlling his engines by word of mouth through the engine-room sky-light.

The boat was coming in finely and the enthusiastic Czech was purring with delight over his engines when, to avoid a collision, the skipper yelled through the sky-light,—"Stop your engines!" Instead of stopping them the Czech walked across the engine-room, looked up through the sky-light with a beaming smile and blandly asked,—"Why?"

By sheer skill in steering the skipper avoided a collision and then proceeded to explain in fluent English why democracy does not work on board ship. And perhaps that little true story will suffice as a parable to explain why democracy must always be a failure when it is up in competition against a one-man show run by a man who knows his job.

### A Democratic Failure.

Now obviously Civil Aviation cannot be a one-man show unless the machines, pilots and everything connected with it are Government property and are run like an Air Force by one man. In Canada it has been, practically a one-man show. That is to say all the forest-patrol work, survey work and so forth has been done by the Operations Department of the Air Board and it has been a success. In the Near East the Cairo-Baghdad Air Mail has been a one-man show, under the Officer Commanding R.A.F. and it also has been a success in its way.

In this country we have tried to compromise on democratic principles and have come very near failure. Each of our Air Lines is itself so-to-speak a one-man show but all are subject to the Department of Civil Aviation in various ways which affect them adversely. For example, the Department of Civil Aviation orders what machines it likes best and then the Air Lines scramble for possession of them. Also the Air Lines receive subsidies which make it possible for them to

exist without being thoroughly efficient. The result is that neither in aeroplane design nor in organisation do the Air Lines approach the degree of efficiency which they would have to attain if they had to exist on their merits in a normal commercial state of cut-throat competition.

Which is why one has always been opposed on principle to the payment of subsidies and why one has always preached that Civil Aviation should succeed or fall on its merits without the help of the over-burdened tax-payer. Railways, omnibuses, motor-cars, taxi-cabs, steamships and so forth succeeded without Government assistance and became efficient all the more quickly because if they were not efficient they failed. And in aviation itself we have the convincing fact that the only passenger-services which pay their way are the various little "joy-rides" concerns which have to be made to pay or else have to shut up shop.

### The Way To Success.

If the Department of Civil Aviation provided proper aerodromes (free of charge at first), proper landing-grounds (also free of charge), proper directional wireless, proper examination and certification of pilots, engineers, and machines (all free of charge) and devoted itself to the regulation of air traffic it would fulfil all the functions proper to such a Department, and it would cost very much less than it does today. When the subsidies were removed some air lines would shut up and some would pay their way. Thus we should make real progress according to Nature's Law of the survival of the fittest.

The firm which procured on the open market the best aeroplanes and engines and ran them most efficiently and charged the lowest fares would get the business and the others would fail—which would be all for the good of Civil Aviation. Only thus can Civil Aviation succeed on its merits.

### Present Follies.

The folly of the present arrangement is shown by the cross-Channel figures for the week ending May 14th. In that week 162 aeroplanes crossed the Channel as against 82 in the corresponding week last year and 75 in the same week of 1920. The crews of those machines numbered 207 as against 101 in 1921 and 87 in 1920. Yet they carried only 261 passengers against 313 in 1921 and 163 in 1920.

All those machines and all their personnel are being run at the expense of the tax-payer. If they were all in the R.A.F. one would not grumble in the least. In fact, if the whole of the Civil Aviation Vote were spent on the R.A.F. one would rejoice over it and ask for more, for the R.A.F. is being starved in a most dangerous way by the Government. But so far as useful work is concerned all this money is being wasted just as much as if it were being spent on joy-riding.

In fact if it were spent on subsidising the little joy-ride firms it would do more good. They at any rate do go round the country educating the country-folk in the uses of flying and enthusing the young so that a certain number of them enlist in the R.A.F., and showing the rural tax-payer that there is reason in maintaining an Air Force. But the Air Lines demonstrate nothing to anybody.

### Specimen Failures.

As mail-carriers they are a complete failure. Only recently one received in London, W.1, at 12.30 on May 17th, a letter "*Par Avion*" post-marked Paris 13.30 on May 16th. If it had gone by rail and boat it would have been delivered by 07.30 on May 17th. If it had been handled as an Air Mail letter should be handled it should have left Paris by 15.30 on May 16th at latest and should have been delivered in London by 20.30 on May 16th.

From the passenger point of view the air-lines are equally abject. On Friday, May 19th, a business man in Paris was coming over to London for the week-end. He left his work early to get to Le Bourget. He spent the whole afternoon there and went back to Paris for the night because, as there was a Channel fog which sloped over a few miles of the coast on



each side, it was impossible to see the ground between Abbeville and Lympne, and so, except for the very early morning machines, nothing crossed the Channel although there was bright sunlight at Croydon and Paris and at a thousand feet or so across the Channel.

On the Saturday morning he went again to Le Bourget and waited for several hours because again there was a fog in the Channel. He came away in disgust, having wasted more than a whole working day in trying to fly across the Channel whereas he could have crossed at night by boat without losing any working time at all.

It is quite true, as one mentioned last week, that three years ago the pilots of Air Transport and Travel, Ltd., would have flown over that fog and would have chanced what would have happened if their engines stopped. To-day not merely are they right to refuse to do so, but they would be criminals if they did so and thus risked the lives of their passengers. The people to blame are firstly the late Controller-General of Civil Aviation and his subordinates for not forcing the French to provide proper ground-observation and wireless control posts in France—as an alternative to which they could have shut down the London-Paris lines altogether and have refused to allow French machines to land in England, just exactly as the Spaniards refuse to allow French machines to land at Tangier. And secondly the Department of Civil Aviation and the Air Lines are conjointly to blame for accepting for passenger use machines which land at high speeds and possess various other qualities which make it impossible for them to glide or fly down slowly in a fog and to land practically without forward velocity, as it is quite possible to do.

When one considers the time wasted and the dangers incurred under present mismanagement—official and commercial—is it surprising that nobody takes the cross-Channel air-lines seriously, no matter what their nationality?

#### The Wrong Way To Work

As passenger-carriers the Air Lines are not regarded seriously and they seem to make little effort—judging by their advertisements—to get themselves regarded seriously.

Gaudily painted models swinging in shop-windows or hair-raising posters of aeroplanes diving onto Alps or illuminated merry-go-rounds do not impress the public with the safety and regularity of flying.

The other day a clever and observant little lady was coming over from Paris and on the way to Le Bourget a man in the same car felt called upon to explain why he was travel-

ling by air. His reason was that he was not obliged to be in England for two or three days so he thought he would go by aeroplane to see what it was like as it did not matter if the machine was delayed by breakdowns. And he could not in the least understand why the lady shrieked with laughter.

Now that is precisely the way in which the public ought not to regard air transport, and it is just the way the public does regard it. And in addition in this particular case although the machine, which was French, did arrive the same day the journey was uncomfortable owing to the draught in the cabin through badly fitting windows and cracks in the fuselage joints and because an engine suffered from internal troubles which gave the impression that it might at any moment dissociate itself from the machine.

Doubtless an English aeroplane would have been more comfortable and would not have had a discordant engine and would have been quicker, so that it would have given a more favourable impression to the uninitiated. But the Air Lines must also remember that there are many people like oneself who know something of aircraft and who would travel by air and would recommend their friends to travel by air if we thought more highly of the technical side of Civil Aviation.

There are some of us do not particularly care about crossing the Channel in machines which may turn over if forced to alight in mid-Channel, nor do we like machines which do not carry adequate and regularly inspected flotation gear. Nor do we like machines which may have to land at 70 miles an hour on rough ground or among trees when we know that it is possible to build a machine which can be brought down as slowly as a parachute. Nor do we like machines which need a run of several hundreds of yards and thereafter can barely scrape over house-tops when we know that variable camber wings can be fitted which will lift them in a few yards. Nor do we relish the idea of being cooked in the air by blazing petrol when we know that for a sum far less than that which is being wasted in subsidies we could have a heavy-oil or paraffin engine which would assure immunity from fire.

And even if we had all the things which we have not on our Air Line machines, why should we pay £6 6s. for a single trip to Paris when we can get there and back first class by rail and boat for approximately £5 15s.? Granted that there is some saving in time, on most occasions few people are in such a hurry as to pay over 100% for it. And there never will be enough such people to make a paying proposition of such prices. (To be continued.)

### THE PROMOTION OF THE ROYAL AIR FORCE.

As intimated in the *London Gazette* dated May 23rd, Sir Hugh Trenchard has now been promoted to the rank of Air Chief Marshal, which rank he is the first person to occupy just as he was the first to be appointed Air Marshal. The rank of Air Chief Marshal is equivalent to that of a full General in the Army and by this promotion not only does Sir Hugh Trenchard attain to a rank for which his high ability and great services to the Empire have long fitted him but the Royal Air Force itself acquires a greater position by having an officer of such rank as its chief.

The R.A.F. in the beginning was formed definitely from the "Air Battalion." At the end of the war, although the R.A.F. was an organisation of vast size it was not under one Officer Commanding in Chief; it was, in fact, in several sections, each commanded by a Major-General and therefore equivalent to a Division. By the time the new Air Force rank-titles came into being demobilisation had reduced the size of the Air Force very considerably and the appointment of Sir Hugh Trenchard to the rank of Air Marshal, which is equivalent to that of Lieut.-General, indicated that the establishment of the R.A.F. was approximately that of an Army Corps. The promotion of Sir Hugh to a rank equivalent to that of a full General in the Army therefore indicates that

the R.A.F. must in future be regarded as the equivalent of an Army.

This shows at any rate that the Government is prepared to move in the right direction and that we need not despair of seeing in the course of the next few years our First Line of Defence enlarged to an adequate size and equipped with material adequate for its great task.

Personally everybody will be delighted that Sir Hugh Trenchard has taken another step forward in his brilliant career. He is at present only 40 years of age, which is very young for a full General, and those who still believe in the high destinies of the British Empire will find much consolation in the fact that according to all natural laws we shall not fail for a great leader of men if, as is almost certain, we shall be plunged into another great war within the next 25 years.

It is not likely that Sir Hugh Trenchard will remain actually in command of the R.A.F. for the next 20 years, but whenever he may retire and whatever may be his mode of life after he ceases to be Chief of the Air Staff it may be assumed that in any national emergency the Government will turn to the man who has made the R.A.F. in war and peace and appoint him again to be the Chief in air war.

### WHITSUN AIR RACES.

The Programme is as follows:—

**THIRD CLUB HANDICAP** (16 miles), prize £20. For machines with a speed not exceeding 120 miles per hour: Lieut.-Col. Spenser Grey, Avro, Spenser Grey; Major H. Petre, Avro, Petre; De Havilland Aircraft Co., Ltd., D.H.9b, Cobham; Lieut.-Col. F. K. McClean, Avro Viper, Hinkler; Bristol Aeroplane Co., Ltd., "Lucifer," Uwins; F. P. Raynham, Sopwith Antelope, Raynham.

**EXHIBITION FLYING** by J. H. James on the Gloucestershire "Bamel," the holder of the British Speed Record.

**FIRST SPRINT HANDICAP** (8 miles), prize £20. For machines with a speed of not less than 110 miles per hour: De Havilland Aircraft Co., Ltd., D.H.9b, Cobham; Major Grant (Aircraft Disposal Depot), D.H.9a (550 h.p. Rolls), Stocken; Major Grant (Aircraft Disposal Depot), Martinsyde F.4, Foot; Major Grant (Aircraft Disposal Board), S.E.5a, Hayns.

**BALLOON SHOOTING** Competition.

**FIRST WHITSUNTIDE HANDICAP** (24 miles), prizes £70. For machines with a speed of not less than 100 m.p.h.—De Havilland Aircraft Co., Ltd., D.H.9b, Cobham; Lieut.-Col. F. K. McClean, Avro Viper, Hinkler; Bristol Aeroplane Co., Ltd., Bristol Lucifer, Uwins; Major Grant (Aircraft Disposal Depot), D.H.9a, Stocken; Major Grant (Aircraft Disposal Depot), Martinsyde F.4, Foot; Major Grant (Aircraft Disposal Depot), S.E.5a, Hayns; F. P. Raynham, Sopwith Antelope, Raynham.

**PARACHUTE DEMONSTRATIONS** by W. Newell. Exhibition Flights.

**SURREY OPEN HANDICAP** (16 miles), prizes £40: Lieut.-Col. Spenser Grey, Avro 504k, Spenser Grey; Flying Officer Alliott, Avro 504k, Alliott; De Havilland Aircraft Co., Ltd., D.H.9b, Cobham; Lieut.-Col. F. K. McClean, Avro Viper, Hinkler; Bristol Aeroplane Co., Ltd., Bristol Lucifer, Uwins; Major Grant (Aircraft Disposal Depot), D.H.9a, Stocken; Major Grant (Aircraft Disposal Depot), Martinsyde F.4, Foot; Major Grant (Aircraft Disposal Depot), S.E.5a, Hayns; F. P. Raynham, Sopwith Antelope, Raynham.

# THE LE BOURGET AVIATION MEETING.

Were one to describe in detail the four days aviation meeting which was held at Le Bourget by the association of pre-war aviators known as "Les Vieilles Tigres," from May 25th-28th it would fill many numbers of THE AEROPLANE in its present size. Therefore one will deal with the general impressions rather than give a connected account of the events, even if one were in a state to do so.

The meeting opened on Thursday morning. The first event was a speed and handicap race run concurrently for the Coupe Lamblin—presented by the famous inventor of radiators—this being a round race from Paris to Brussels, thence to Croydon and back to Paris. The competitors started soon after 11.00 hours, these being MM. Casale and Bajac and Capt. Stocken, the latter flying the Aircraft Disposal Co.'s D.H.9a. Capt. Stocken led most of the way, but soon after leaving Croydon he ran into the big hail-storm which occurred on that day, and turned his aircraft into an excellent replica of a shell-bivvy pipe. This took about 15 miles an hour off his speed and the three competitors arrived at Le Bourget at about 17.00 hours.

It was at first thought that Capt. Stocken had won both the handicap and the speed race, and the French were the first to congratulate him. It was then seen from the times that he had made the fastest time, but on his handicap he was only second, Bajac having won and M. Casale being third.

During the time that the machines were away numerous other competitions were in progress and machines were in the air continuously. An amusing episode was the Concours d'Atterissage Militaire. Many well-known pilots were participating and MM. Paulhan and Boussotrot on Farman "Sports" in their efforts to land slowly but turned up on their noses. A special military pilot from Nancy was brought up to show how landing should be done. He came in slowly on a Bréguet over the Handley Page hangar, which he struck with his undercarriage, finishing on his nose with his undercarriage smashed, thereby demonstrating how the French military aviators can land when they want to if they try.

During the proceedings M. Frouval on a Morane "Parasol" specially strengthened for stunting was giving a very fine exhibition of rolls, slow loops and upside down flying. Several other machines also attempted to do so, but were quite overshadowed by Frouval. In the evening there was some excellent formation flying by Les Vieilles Tigres and so to Paris for instruction by Mr. Ponsoby.

The following day two more competitors started out in search of the Coupe Lamblin, but returned owing to the mist. The most exciting event of the day was a flight by

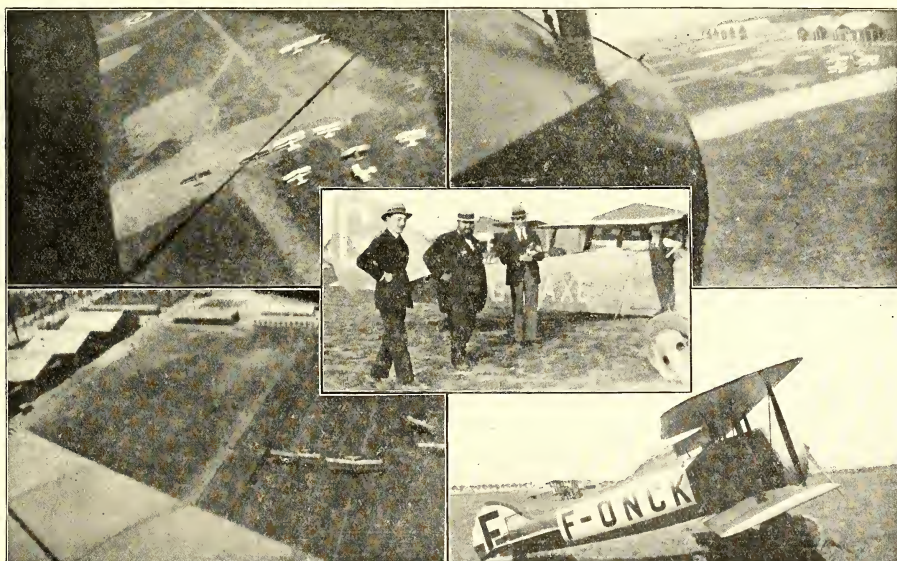
M. Sadi-Lecoq on the Nicnport-Delage Gordon-Bennett racer of 1920. The machine, though not frightfully speedy, was quite quick and took the whole length of Le Bourget to land itself. It appeared that the machine could have been landed almost as slowly as Mr. James lands the much faster Bemel.

On Saturday the chief event was the Coupe Dubonnet, which consisted of a relay race of 6 circuits round a thirty mile course. At the end of the fifth circuit Capt. Stocken on the D.H.9a was leading easily, the second competitor in the race being Spad No. 44 flown by a military pilot. As they were starting off for the last circuit, when Capt. Stocken was about to feet from the ground, this Spad swerved right across Capt. Stocken's bows. The latter to avoid a serious collision put on full right rudder and pulled the stick right back without having much flying speed. At the same moment M. Robert Morane, on a Morane monoplane, dived up underneath Capt. Stocken in his direct line of flight and this machine had its cabane struck by the undercarriage of the 9a. It was thrown about 20 yards and was entirely smashed.

Capt. Stocken's undercarriage was knocked right off, but he managed to maintain control of the machine and landed on the fuselage without further damage. All the French officials, pilots and the public were very enthusiastic over Capt. Stocken's fine flying throughout the meeting and realised that it was only a very fine piece of flying that saved a very bad smash, and the President of the meeting personally congratulated him. M. Robert Morane seemed somewhat startled by the rather sudden broadcasting of his monoplane, but remarked that he did not mind being killed though he did not want to be hurt.

One cannot say too much of the way the French officials treated all the English pilots, staff, etc., who were on the aerodrome. They did their utmost to help them and make the meeting as enjoyable for all as possible, and M. Raffalovich is to be congratulated and thanked for his wonderful organisation of the 126 machines which competed in the week's proceedings.

Mr. Loveland of the Aircraft Disposal Co., who acted as mechanic to Capt. Stocken, also deserves congratulation for his very stout efforts. He kept the 9a in good running order the whole time, besides which he had to act as nurse to Wilfred & Co. in helping to tie their May-Fly-Round-the-World machine. Also he acted as Capt. Stocken's passenger in the relay race and showed that he might have an excellent chance in the two yards sprints in the next Olympic Games. There were very many interesting machines present,



AT THE MEETING OF "LES VIEILLES TIGES": Centre, M. Lamblin and beard, with Mr. Stocken behind him, and Mr. Loveland of the Disposal Co. in his shirt-sleeves beside the "delegated" D.H.9a. Top and left lower, views of Le Bourget taken by "G. D." from M. Boussotrot's "Sport" Farman. Right lower, Captain Fonck's Spad.



including the Farman Sport, the Potez Sport, the Spad Sociable, several Cadourens and Nieuports, the Ricci Triplane and various Moranes. Of the small machines the Farman Sport struck out as being an ideal two seater runabout.

M. Bossoutrot was kind enough to take one for a joy-ride in the machine, which has a wonderful climb and take-off and slow landing speed. Certainly we in this country have got nothing, save the Avro Baby, which has not yet been produced in quantity, to touch it. It is easy to fly and this

particular machine has been flying for over three years without any trouble.

Les Vieilles Tigres, and M. Raffalovich in particular, are to be very much congratulated not only on running a very entertaining and educative aviation meeting, but also in doing far more than any International Conferences will do to establish good relations between British and French who interest themselves in things aerial. May the good work continue.—G. D.

## R.A.F. INTELLIGENCE.

### The King's Levee.

H.M. the King held a Levee at St. James Palace on May 20th. H.R.H. the Duke of York, K.G., was present. Air Chief Marshal Sir Hugh Trenchard, Principal Air Aide-de-Camp, was in attendance upon His Majesty.

Among those who attended the Levee were Major the Hon. Maurice Barring and S/Ldr. F. Sowrey.

The following were the Presentations to the King by the Secretary of State for Air:—Hanson-Abbott, F/Lt. Clifford; Bayly, F/Lt. Leonard J. St. G. M.C.; Coleman, F/Lt. Francis H.; Cullen, F/Lt. Ian, A.F.C.; Davies, F/O Edward D. H.; Glynn, S/Ldr. Arthur S.; Gorell, the Lord, C.B.E., M.C., on appointment as Under-Secretary of State for Air; Gossage, Wing/Cmdr. Ernest L., D.S.O., M.C.; Hebdon, Wing/Cmdr. Sacheverell A., O.B.E.; Higgins, Air Vice-Marshal John F. A., C.B., D.S.O., A.F.C., on appointment as Air Officer Commanding, Inland Area, R.A.F.; Banks-Jones, F/Lt. Ralph M.; Lane, S/Ldr. Robert C.; Lee, F/Lt. Arthur S. G., M.C.; Munro, Wing/Cmdr. David C. L.F.; Jenner-Furse, F/Lt. Charles H. B.; Spicer, Wing/Cmdr. Malcolm; Walser, S/Ldr. André A., M.C., D.F.C.; Wells, S/Ldr. John K.; Western, F/O James G., M.B.E.

By Lt-Col. Leslie Wilson, C.M.G., D.S.O., M.P.:—Raper, Mr. Baldwin, M.P.

### From the "London Gazette," May 23rd.

AIR MINISTRY, May 23rd.  
ROYAL AIR FORCE.—Air Marshal Sir H. M. Trenchard, Bart. K.C.B., D.S.O., Principal Air Aide-de-Camp to the King, is promoted to the rank of Air Chief Marshal (April 1st).

### A Flying Services Memorial.

A memorial window in Westminster Abbey to the memory of the officers and men of the Flying Services who fell in the War was dedicated by the Dean of Westminster on May 25th. The window is the gift of Mrs. Louis Bennett, of West Virginia, U.S.A., whose son was killed while serving with the R.A.F.

Captain F. E. Guest, D.S.O., M.P., Secretary of State for Air, unveiled the window.

The R.A.F. Central Band and detachments of R.A.F. personnel from various Units were present.

Among the congregation were:—Lord Gorell, Under Secretary of State for Air, Air-Chief Marshal Sir H. M. Trenchard, Bart., K.C.B., D.S.O., A.D.C., Air Vice-Marshal J. F. C. Higgins, C.B., D.S.O., A.F.C., Sir W. G. H. Salmond, K.C.M.G., C.B., D.S.O., A. V. Vyvyan, C.B., D.S.O., and F. W. Gamie, C.B., Air-Commodore O. Swann, C.B., C.B.E., F. R. Scarlett, C.B., D.S.O., C. L. Lambie, C.B., C.M.G., D.S.O., J. M. Steel, C.M.G., C.B.E., C. A. H. Longcroft, C.M.G., D.S.O., A.F.C., D. le G. Pitcher, C.M.G., C.B.E., D.S.O., F. C. Halahan, C.M.G., D.S.O., D. Munro, R.A.F.M.S., and the Rev. H. D. L. Viener, Chaplain-in-Chief. Group-Captains P. L. W. Herbert, C.M.G., C.B.E., E. R. Ludlow-Hewitt, C.M.G., D.S.O., M.C., A.D.C., and E. P. Briggs, D.S.O., O.B.E.

### The Royal Air Force Pageant.

The Air Ministry announces that the R.A.F. Pageant is being held at the London Aerodrome, Hendon, on Saturday, June 2nd.

The Pageant is an integral and important part of the annual training of the R.A.F. and fulfils the same functions as does the Royal Tournament in the case of the Army and Navy.

The Pageant provides an opportunity of bringing together representatives of the different types of squadrons which carried out the varied work of the R.A.F. This enhances its value from the training point of view, while a valuable stimulus to keenness and efficiency is provided by the inter-unit competitions and displays.

A programme has been arranged which will fully equal that submitted in previous years. New features are being introduced which will enable the public to appreciate the developments that are constantly taking place in the aerial arm. Full details of the programme, the most spectacular item of which is the destruction of a desert stronghold by bombing aircraft, will be issued shortly.

### Reform in India.

As was notified in this paper last week and as has since been notified in other papers, Vice Air Marshal Sir John Salmond is to pursue an inquiry into the state of affairs in the R.A.F. in India before proceeding to take command in Iraq on October 1st. It is now announced that he will be accompanied by Group Captain J. A. Chamier, C.M.G., D.S.O., O.B.E., Deputy Director of Operations and Intelligence at

the Air Ministry and by Wing Commander F. B. T. Hewlett, D.S.O., O.B.E.

Wing Commander Chamier distinguished himself highly during the War and showed himself particularly able not merely in handling men, but in selecting men. Recently he went with Air Vice Marshal J. F. A. Higgins to the Disarmament Conference at Washington, and one gathers that there also he did extremely valuable work, his judgment of men proving of immense advantage. Captain Chamier's appointment is all the more valuable in that at the beginning of the War he was a Captain in the 33rd Punjab, formerly the 33rd (Punjab) Bengal Infantry, and thus has a general knowledge of the Indian Army and a peculiar knowledge of the Northwest Frontier.

Wing Commander Hewlett was one of the pre-War K.N.A.S. pilots and on Christmas Day, 1914, took part in the famous raid on Cuxhaven. His war experience was purely naval, whether on active service during the earlier part of the War or on technical work later in the War. In all his work he has shown a high degree of intelligence and should therefore be of considerable value to the Air Vice Marshal both in India and in Iraq.

Though no official announcement has been made it seems probable that Sir John Salmond will be promoted to the rank of Air Marshal before he reaches India. This would give him rank equivalent to that of Lieut.-General in the Army and so would enable him to deal on more level terms with the high Army authorities in India. It will also be better for affairs in Iraq in that Sir John is succeeding Lieut.-General Sir J. A. L. Haldane, G.C.M.G., K.C.B., D.S.O., who will thus be relieved by an officer of equal rank.

It is generally understood that Sir John Salmond will be succeeded as Air Officer Commanding the Inland Area by Air Vice Marshal J. F. A. Higgins, C.B., D.S.O., A.F.C., who represented the Royal Air Force so ably at the Washington Conference. Air Vice Marshal Higgins had the distinguished career of gunner officer before joining the R.F.C. He was highly successful as a Commanding Officer both in the field and at home and it is very much to the advantage of the R.A.F. that he should now return to actual command instead of being employed on theoretical work even though he has done that work with all the success which was expected of him.

His appointment will moreover deprive Mr. Harmsworth, M.P., of an opportunity for asking foolish questions.

### The Malta-Gibraltar Flight.

Air Commodore Samson, C.M.G., D.S.O., A.F.C., Air Officer Commanding the Mediterranean Group, R.A.F., who flew from Malta to Gibraltar, arriving at the latter port on May 18th, started his return journey on May 20th. Thirty miles west of Oran the flying boat came down in the sea and was towed into port.

It was later announced that on May 27th, while being towed to Malta by a British destroyer, the machine was washed off a lighter in a heavy sea and lost. Thus another obsolete aircraft is deleted.

### The R.A.F. India.

The *Times* correspondent, cabling from Simla on May 21st, says: "An additional allotment has been made to the Air Force in view of the recent revelations of the value of the Force on the frontier. The allotment does not add to the Military Budget. Describing the allotment as satisfactory the *Pioneer of Allahabad* expresses anxiety as to the ability of the Force to meet emergencies in view of the reports of woeful deficiencies of spare parts and wing headquarters."

One would have imagined that the trouble was rather a superfluity of High Commands than a deficiency.

### Independent Force R.A.F. Reunion.

The fourth annual reunion dinner of the Independent Force will be held at the Hotel Cecil at 8 p.m. on Monday, June 10th. Sir H. M. Trenchard, Chief of the Air Staff, who commanded the Independent Force in France, will preside.

Among those who have already notified their intention of being present are the Duke of York and General de Castelnau, who commanded the French Army of the East from whose area the Independent Force operated.

Tickets, 15s. each, can be obtained from the Hon. Sec.,

[Continued on Page 392.]



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# AERONAUTICAL ENGINEERING

## SUPPLEMENT TO "THE AEROPLANE"

INCORPORATING AIRCRAFT ENGINEERING AERODYNAMICS, AIRCRAFT FINANCE AND COMMERCIAL AERONAUTICS  
AND MATTERS PERTAINING TO THE AERONAUTICAL ENGINEER AND THE AIRCRAFT TRADER.

### THE WEEKLY COMMENTARY.

The remarkably interesting methods of all-wood construction which have been developed by Mr. G. H. Handasyde for the manufacture of the new Handasyde monoplanes are described below. It will be noticed that this machine is much more nearly an all-wood machine than is the standard type, for except in connection with the undercarriage it is believed that there is not even one single steel wire used for structural purposes.

No attempt has been made to describe the machine as a whole, for the reason that the actual structural details are so unusual that they deserve description on their own account.

A note recently published under the title of "Landing Speeds and Safety" has drawn from a very experienced and well-known pilot a letter which although it to some extent disagrees with the opinions expressed in that article, yet really strongly reinforces the opinion there expressed that the present type of heavily loaded commercial machine has features making for the reverse of safety.

The statements made in this letter are of a very grave nature, and suggest that the Department of Civil Aviation has signally failed to carry out one of its most elementary duties.

### THE HANDASYDE TYPE H.2 MONOPLANE.

In THE AEROPLANE of Oct. 12th, 1921, there appeared a general description of the new type of monoplane designed by Mr. G. H. Handasyde of the Handasyde Aircraft Co. At the present moment there are in course of construction at the Air Navigation Co.'s works at Addlestone certain machines of this same design which are destined for one of the new passenger and mail services in Australia.

In the original description two projected types were mentioned—one a Napier engine 10-seater, the other a 300 h.p. Hispano Suiza 6-seater.

The machines now being built are generally of a similar size and form to the smaller of the aforementioned types, but are to be equipped with 350 h.p. "Eagle 9" type Rolls-Royce engines. They are designed for the carriage of 5 or 6 passengers and an additional load of mails, making a total commercial load of 1,200-1,500 lbs. The top speed is guaranteed to be 115 m.p.h., but it is expected that the speed actually realised will be considerably greater. The total loaded weight will be about 5,000 lbs. A complete description and specification of the finished machine will be published as soon as reliable data have been obtained from tests, but in the meantime the designer prefers not to publish any details of dimensions and weights, or to claim definite performances.

But the very novel methods used in its construction have an interest quite apart from these more specific details of the particular machine, and some of these one has been allowed to examine and describe.

The machine is to a very large extent a purely timber structure. Very little metal work is used, and the few metal fittings are of a simple and robust character.

#### THE FUSELAGE.

The fuselage—which is apparently the least novel part of the machine—appears to be of the normal three-ply covered type now so widely in use. Actually it has a number of novel features, and is not quite so commonplace as it might at first appear. It is really of the braced longeron and strut type, the bracing being performed by the ply wood skin. The "struts" are in the form of hoops, which also act as formers.

This fuselage is built in two parts, the forward one an engine-carrying nose, and the after part, which contains cabin, etc., and carries the tail. The main fuselage body is built on four longerons—each one of which is in three straight lengths. The forward length, of spruce, covers the space occupied by the pilot's cockpit. Over this space the longerons diverge rapidly in side elevation from front to rear. There follows a second straight length, corresponding to the passenger cabin, which is also of spruce. Over this space the four longerons are parallel. From the rear of the cabin to the tail the longerons are of ash. The top longerons over this section slope down very slightly towards the tail, the lower longerons sweep up very considerably.

Joints between these longeron sections are of the simple fishplate type, and are covered by the three-ply skin—so that the main body of the fuselage is not a dismountable structure.

The front frame of the forward section consists of four spruce members, with three-ply cornerpieces. There is an intermediate set of four spruce struts and thereafter follows the hoop structure of the cabin.

The hoops—which are in effect the fuselage struts, in this cabin portion—are of box section. The inner member of each box is a bent hoop made of ash in two plies. The outer members are of spruce, and the sides of the box are formed by three-ply. The whole structures are glued and screwed together.

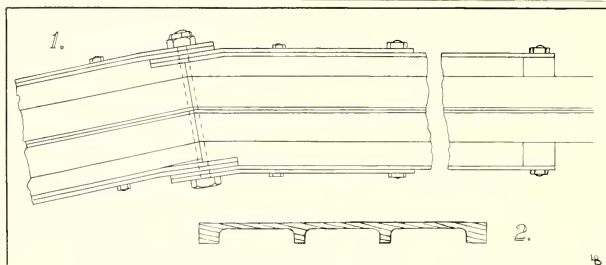
The after "hoop" at the cabin end has the three-ply sides of the box extended inwards, and a door-frame worked into the structure, thus partitioning the cabin from a mail compartment which is immediately aft of it.

Aft of the cabin, the struts are built up of spruce only, but are in general of the same type of shape as the cabin hoops. The first beyond the cabin is three-ply covered to form the bulkhead of the goods space, but is fitted with a sliding door so that one may crawl into the after part of the fuselage for inspection. At the rear end of the body there is another solid bulkhead just forward of the front spar of the tail plane.

Over and above the four main longerons there are numerous stringers of spruce from the front of the cabin to the tail. In the cabin length these stringers are continuous, except for the necessary stoppage at the door, which is arranged between the first two of the cabin frames. They are let into the outer spruce members of the hoops. Over the after part these stringers are stopped at each frame, and serve only to support the outer skin. The skin of three-ply is screwed to all frames, longerons, and stringers. Joints in the three-ply are made by butting the two sheets, applying a "fishplate" of three-ply about 4 inches wide on the inside only, and riveting through from skin to "fishplate" with hollow rivets of about  $3/16$  dia. pitched about 3 inches apart.

The general appearance of a fuselage framework uncovered is shown in one sketch. A succeeding sketch shows the engine-carrying nose which is attached to the main body. This nose consists of two ash members on each side, which meet at a forward cross member of five-ply spruce. The engine bearer tubes run from the front cross member to the upper cross member of the bulkhead in front of the pilot. This nose does not form a detachable engine mounting, because the after support for the engine bearer is part of the main fuselage structure. The nose is however removable after taking out engine and bearers, and this appreciably simplifies packing up the machine for transport.





WING STRUCTURE.

The structure of the wings is the most interesting part of this machine. The machine is of the cantilever monoplane type, with the wing entirely above the fuselage. The whole conception of these wings is unusual. They are of the multi-spar type, with a wooden covering, and apart from the joints between the wings and the body, the two halves of the wings, and the aileron hinges and control mechanism the only metal parts employed are screws.

The wings are heavily tapered, both in plan and in section, from root to tip. The leading edge sweeps back slightly, the trailing-edge very pronouncedly. The section is an unusual one. The top surface is of the usual type, with its maximum camber in the region of  $\frac{1}{2}$  the chord from the leading edge. The lower surface is practically flat over the spars, but slopes down sharply from the leading edge to the front spar, and somewhat less sharply up from the rear spar to the trailing edge. The section therefore is biconvex. The four spars, which are spaced at approximately equal intervals across the chord, are all of the H section built up, with top and bottom flanges of spruce in two halves, and a web of spruce two-ply, which web is covered with glued on fabric. The flanges are glued and screwed to the webs.

The ribs are formed of three-ply built in sections which fit into the recesses in the spars. They are stiffened with spruce members glued and screwed to them, roughly parallel to the wing surfaces, but considerably inside those surfaces. The outer edges of these rib webs are notched between spars, the through-going spruce longerons are run through the notches. There are two of these stringers between each spar. Over the stringers is applied a set of continuous spruce laths, which form the rib flanges proper. These are screwed to each spar and stringer. The covering consists of strips of spruce, corrugated internally, which are laid on parallel to and flush with the rib flanges, and are also screwed to each stringer and spar. This spruce skin serves the purpose of drag bracing, and also as the top and bottom flanges of the composite girder formed by the whole structure. The leading edge and the trailing edge are formed by three-ply

formers similar to those between spars, which are supported by the through rib flanges. These are also provided with longitudinal stringers running right through. The leading edge proper is formed of three-ply bent to trough section, screwed to the leading stringers, which are of extra heavy section. The trailing edge is of solid spruce.

The details of this very novel wing structure are well shown in some of the accompanying sketches.

The wings are built in two sections, which join on the centre line of the machine. Owing to the fact that except in the case of the front spar, all spars meet at an angle, it has required some ingenuity to obtain a simple form of joint. A sketch shows how the difficulty has been overcome.

The wings rest on the top rail of the fuselage over the cabin. An aluminium block is fitted beneath each spar, and this block carries at its outer end a downward projection which registers on the outside of a mating block of the same material on the longeron. This block on the longeron is fitted with two upwardly projecting tongues, one of which registers on each side of the block on the spars. Therefore when each set of these blocks is properly engaged, the wing is accurately located both laterally and longitudinally in reference to the fuselage.

The lift load from the spar is taken to the main fuselage structure through one right- and left-hand screw adjuster—generally of the nature of the ordinary wire stainer, which is coupled at the top to a strap surrounding the spar and at its bottom to a lug attached to one of the main fuselage frames.

From this description and from the sketches it can be realised that this machine has many features of great novelty and interest. The type of construction is necessarily somewhat expensive at the outset, but as soon as the necessary jigs are set up repetition should be extremely cheap. The absence of complicated metal fittings allows the machine to be built by any competent staff of woodworkers, and if in fact the type proves to be free from trouble due to warping of the timber, it may prove to be a serious rival to metal structures in the future.

## LANDING SPEEDS AND SAFETY.

The following letter has been received:—

Sir,—The article in "Aeronautical Engineering" of this week on the subject of "Landing Speeds and Safety" raises points of such immediate importance that perhaps a pilot's view might be put forward.

With a lot of experience of the matter in question, I must say that I am entirely in agreement with Capt. de Havilland that, provided the pull-up is short, a high landing speed is not of any particular danger. For commercial purposes there are actual conditions where it is preferable to very slow landing speeds.

The objections raised in your article are in the main quite accurate, but they form so small a proportion of the factors which occur in a forced landing that, without discussing them in detail, they may be almost disregarded. But I will mention that I do not consider that the real high-lift wing will provide both heavy wing-loading and slow landing, since the designer has merely to put on still more load and land at the same speed.

I therefore regret that the relatively unimportant question of high-landing speed is so vehemently discussed, since it serves to obscure the question of immediate and extreme importance—the taking-off run. This is *not* governed by the same factors as the landing speed. It is not strictly accurate to say that "high landing speed means high getting-off speed and therefore a long preliminary run."

If you have heavy wing-loading, you have high landing speed and high getting-off speed and presumably economy. But if you have a large reserve of horse-power you have not a long getting-off run. It seems, therefore, that to be safe

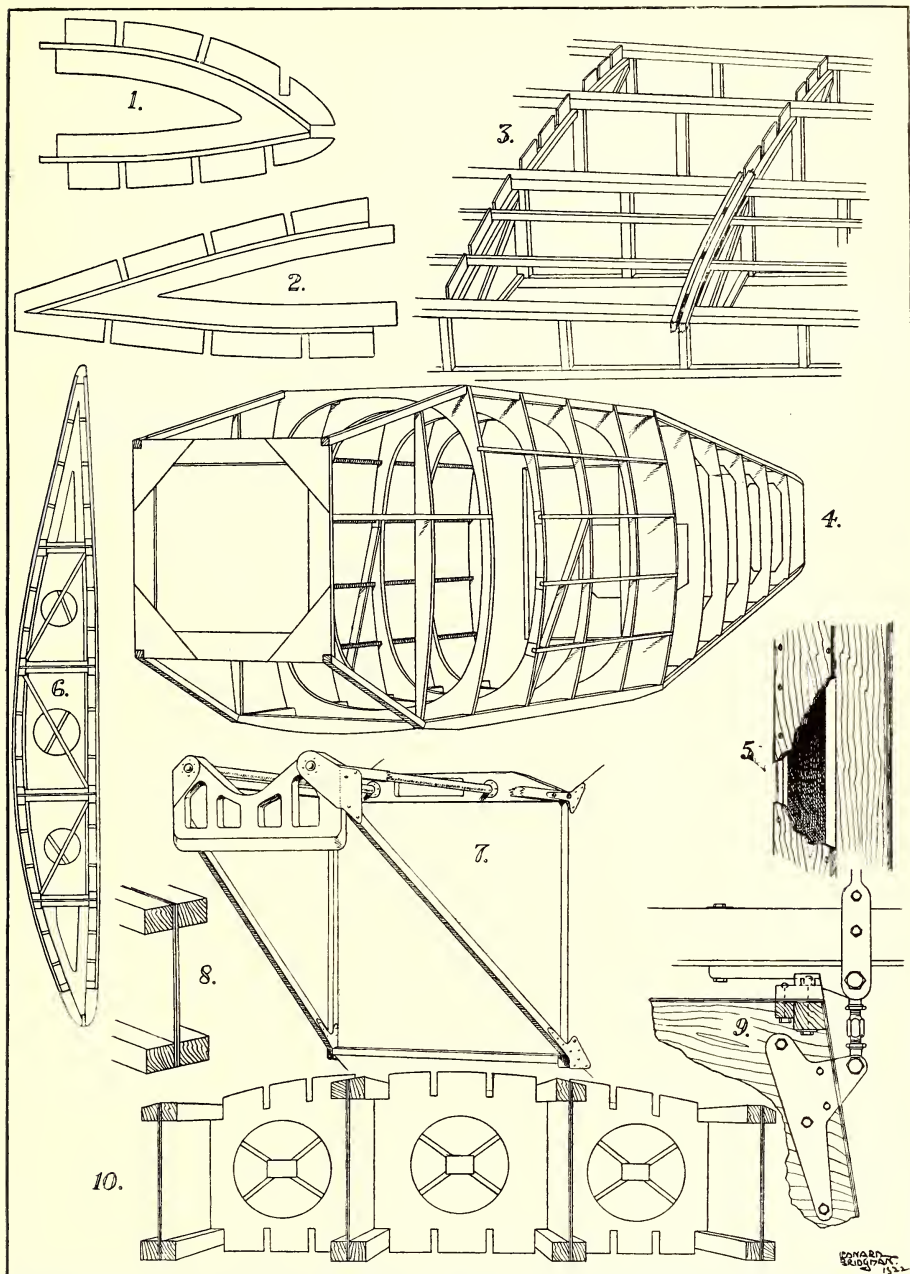
you must have a good reserve of horse-power, or you must cut out the presumably desirable heavy wing-loading.

*At the present moment practically all commercial pilots are agreed that, unless Aviation has the undivided forces of Heaven looking after it, we are going to see this year the most glorious crash due to the failure of a machine, of heavy wing-loading combined with heavy power-loading, to clear the obstacles suitably arranged around Croydon Aerodrome.*

And the reason will be this: Circumstances seem to have forced on designers a horrible competition to see who can carry, for a given cruising-speed, one more passenger than the last man did with a Rolls "Eagle" or a Napier "Lion." Thus wing loading and power-loading are racing up together until we have the ghastly taking-off scenes now a regular feature of commercial aerodromes, which will certainly have a fatal termination before long.

The most desirable solution seems to be to retain the high wing-loading, and to increase the reserve of power by designing to carry a revenue load of say 1,200 to 1,400 lbs. with a "Lion," instead of the present 1,600 to 2,000 lbs. at a cruising speed of 100 m.p.h. This would mean treating the engine as being of much lower horse-power (and thereby retaining the economy) merely using the extra power for taking-off and emergencies.

The only reasons against these solutions are that aero-engines are at present so expensive that the constructor probably considers the reserve power as too dear a commodity to carry around—although the less strenuous running of the engine in normal flight would probably compensate for this; or that the designer is afraid that a possible purchaser will



DETAILS OF THE HANDASYDE MONOPLANE.—(1) the nose and (2) the tail of one rib former. (3) Part of the main wing structure, showing the four main spars and two ribs. The left hand rib is without capping strips. The through stringers are in place between the two nearest spars, and the capping strips are in place over the first section of the right-hand rib. (4) The skeleton of a fuselage seen from the front. (5) Section of one of the fuselage main hoops showing construction. (6) Elevation of a complete rib (compare figs. 1, 2, 3, 4). (7) The nose of the fuselage. (8) Diagram of wing spar structure. (9) Attachment of a wing spar to the fuselage. (10) End view of a wing root, showing spars and four sections of the formers for a rib.

come up and say: "But So-and-So's machine carries one more passenger than yours for the same engine." Any idea that the pilot might misuse the reserve could be dealt with by propeller design and revolution-checking instruments.

Presuming that designers are not permitted to give this reserve of power, then of course wing-loading, and thus cruising speed, will have to come down. This will give us a lower landing speed, but, far more importantly, will give us a shorter taking-off run. And then pilots will cease to wonder which of them is going to be the first to do it.

(Signed) F. T. COURTNEY.

If it is indeed the fact—as stated by Mr. Courtney—that the "get-off" of some of the modern passenger-carrying machines is so bad that there is serious risk of accident in taking off from Croydon Aerodrome, the matter is very definitely one to be taken up by the Department of Civil Aviation. There should certainly be no question of the issue of an airworthiness certificate for any machine which has not ample reserve of power to emerge safely with full load from any reasonable aerodrome even under the worst possible circumstances.

The Air Ministry has ample opportunities for discovering the capabilities of all machines in such matters, and if it cannot be relied upon even to make certain that licensed machines are fit for normal taking-off and landing on their regular terminal aerodromes they must be held to have neglected their most elementary duty to a criminal extent.

On purely technical grounds one cannot entirely agree with Mr. Courtney that the getting-off trouble is not to be cured by the same method as the high landing speed. It is of course perfectly true that one can make a machine which will land slowly, and will yet take a long time getting off. But for equal power-loadings, other things being equal, the machine with the lower landing speed should always have the quicker take-off, and it should also have a lower climbing speed, at least an equal climbing rate, and therefore a steeper climbing gradient. The factors affecting the time and distance required for getting-off are three. During acceleration work is done in actually accelerating the machine. The amount of run taken depends solely on the weight of the machine, the speed to which it has to be accelerated (that is the getting-off speed), and the thrust available for this purpose. The thrust available is the whole aircraft thrust, less that required to overcome (a) ground resistance and (b) aerodynamic resistance.

If the sum of the items (a) and (b) are the same for two different machines of equal weight per h.p., the machine with the lower getting-off speed will inevitably get off in a shorter time and a shorter run than will the other.

With equally good undercarriage design, the ground friction factor will depend on weight of machine alone. If low landing speed is attained by increased wing surface of a wing of the usual type, the aerodynamic resistance factor may increase on the lightly loaded machine. It is very unlikely to increase to such an extent as to wipe out the decreased work needed for acceleration to the lowered getting-off speed.

If the lower landing speed is attained by the use of a higher lift wing, the aerodynamic resistance factor should be decreased. With equally good design in the two cases the low landing speed machine will also be a quick "get-off" machine.

It is of course perfectly true if designers propose to use high lift wings simply as a means to the attainment of the maximum of paying load regardless of safety of operation, that the last state of the commercial aeroplane will be worse than the first. But at any rate in writing in the Press it has to be assumed both that designers will themselves give some reasonable attention to questions of safety, and that the authorities concerned with the licensing of aircraft will perform at least their primary duties in such matters.

### THE INSTITUTION OF AERONAUTICAL ENGINEERS.

On Thursday, May 25th, Major D. C. M. Hume read a paper on "The Seaplane's Place in Aviation" at the Engineers' Club, Coventry Street. The paper, which is of an extremely interesting nature, and which was followed by a distinctly useful discussion, will be dealt with adequately at an early date.

The Institution, which has now completed its programme of papers for the present session, is to be congratulated upon the quality of the lectures during this period. All of them have dealt in a simple but none the less accurate manner with topics of real importance, and all of them have been of a type which should interest everyone—whatever the extent of his technical knowledge—who is concerned with aviation. Most of the meetings have been of an informal nature, and it is to be hoped that a knowledge of the work of the Institution will become widespread, and that in the future the meetings will be more widely attended than has been the case in the past.

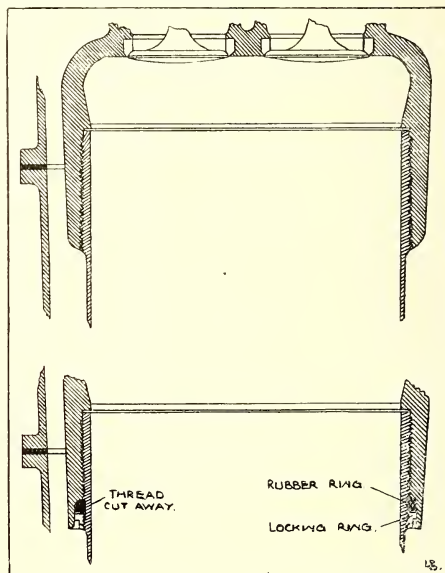
### THE WILBUR WRIGHT MEMORIAL LECTURE.

The Royal Aeronautical Society announces that the annual "Wilbur Wright Memorial Lecture" will be delivered at 5.30 p.m. on Thursday, June 15th, in the theatre of the Royal Society of Arts, John Street, Adelphi, when Lt.-Col. A. Ogilvie, C.B.E., F.R.Ae.S., will read a paper on "Some Aspects of Aeronautical Research."

### AN IMPROVED "PUMA" CYLINDER BLOCK.

A certain number of cases have occurred in which water has been found to leak into the cylinders of Siddeley "Puma" engines after they have been in use for a considerable period. As is generally known, the "Puma" cylinder blocks are of cast aluminium alloy, into which a steel liner is screwed. This liner forms the inner wall of the water jacket space.

The screwed joint at the cylinder head was of considerable length and it alone was relied upon to prevent water leaking into the cylinders. Owing to the large difference in the coefficient of expansion with change of temperature as between the steel of the liner and the alloy of the block, this joint has occasionally lost its tightness in the course of time and has caused the above-mentioned trouble.



In order to overcome this trouble, Armstrong Siddeley Motors, Ltd. have now introduced a new form of cylinder block, which is interchangeable with the older type.

The thread on the steel liner is cut away over a short part of its length, towards the bottom of the threaded portion. A recess is formed in the block casting, and when the liner is screwed into place a rubber ring is forced into this recess, where it faces upon the unscrewed part of the liner, and is compressed by a bottom ring which is screwed onto the lowermost threads on the liner. A sketch is given which shows both the original and the new form for this joint. A rubber ring joint of practically the same type has always been used for the lower water jacket joint on this engine and has always been thoroughly satisfactory, so that it may confidently be expected that no further trouble will arise with the upper joint in the future.

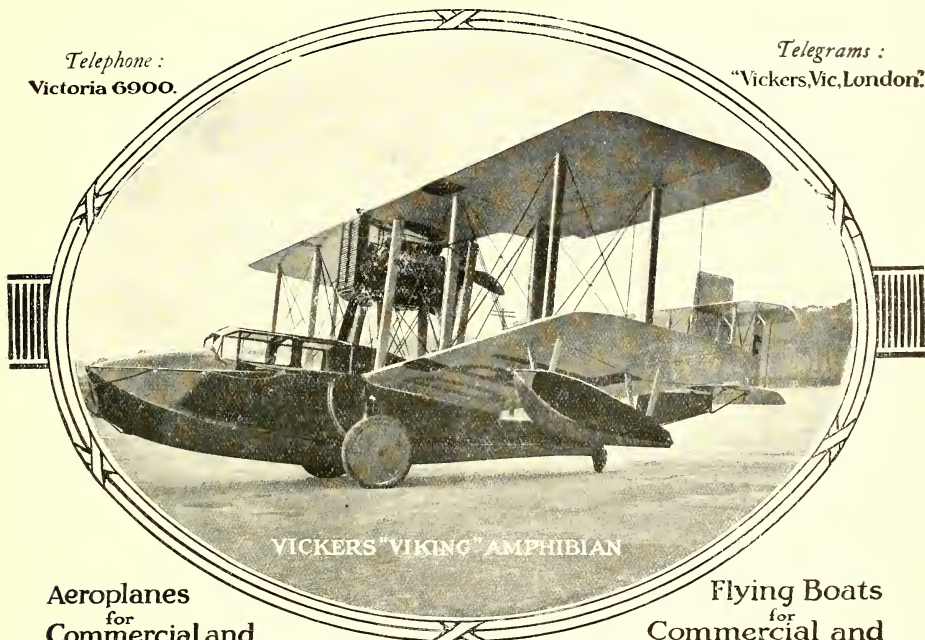
### SMITH'S AGAIN.

S. Smith & Sons (M.A.) Ltd., are again to the fore in the latest flight which is attracting public attention. The D.H.9. (Siddeley "Puma"), in which Capt. Norman Macmillan is piloting Major Blake and Lt.-Col. Broome in their Easterly tour in the Northern Hemisphere, is fitted with the usual galaxy of Smith's Aviation Instruments. K.L.G. Flugs, for which S. Smith & Sons are the selling agents, are also fitted to the machine. For navigating purposes Capt. Macmillan is using one of the new Campbell Bennett Aperiadic Compasses in addition to an ordinary standard 256 Compass.



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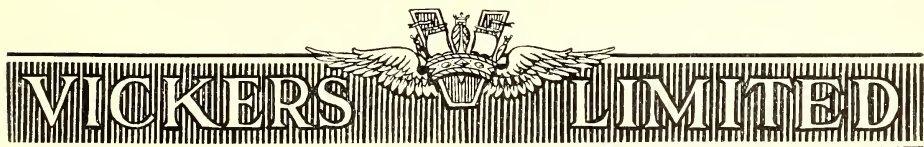
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Buildings, Pilgrim Street.  
GLASGOW: Vickers House, 247,  
West George Street.  
BRISTOL: 55, Park Street.  
DUBLIN: 32, Nassau Street.  
LEEDS: Greek Street Chambers,  
Park Row.

Brief Specification:  
Viking Mark IV  
6 Passengers and  
baggage or 1,360  
lbs Freight.  
RANGE: 340 miles.  
SPAN: 50' 0"  
HEIGHT: 15' 1"  
LENGTH: 35' 0"

The Vickers "Viking"  
was the winner of  
the FIRST prize of  
£10,000 for the  
Amphibian Class  
of Aircraft entered  
for the BRITISH  
AIR MINISTRY  
COMPETITION,  
September, 1920.



Aviation Department,  
VICKERS HOUSE, BROADWAY, LONDON, S.W.1.

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.

[Continued from Page 384.]

Independent Air Force Dinner, Room A337E, Air Ministry, W.C.2

## R.A.F. SPORTS AND PASTIMES.

### The R.A.F. Club Cricket Week.

It is now officially announced that the Royal Air Force Club Cricket Week is to be held under the distinguished patronage of H.R.H. the Duke of York, K.G., with Captain F. E. Guest, D.S.O., M.P., Secretary of State for Air, as President, and the Chief of the Air Staff, Air-Chief-Marshal Sir H. M. Trenchard, Bart., K.C.B., D.S.O., as Vice-President.

The Sub-Committee dealing with the matter includes the Hon. F. Calthorpe and H. D. G. Leveson-Gower in addition to the names already published.

Play will be by invitation only, but at the same time the Hon. Secretary (Capt. Maurice Kiddy, Denison House, Vauxhall Bridge Road, S.W.1) will be glad to hear of the names of all first-class amateurs or professionals who served in or were attached to the R.F.C., R.N.A.S. or R.A.F., who will be free during the month of September.

### Halton.

CRICKET.—The following trial took place at Halton on May 22nd—No. 7 Group v. The Rest.

The Rest.—F/Lt. E. A. Fawcett, c. Lees, b. Thompson, 22; S/Ldr. E. H. Spalding, retired, 32; F/Lt. F. G. C. Wear, b. Weston, 17; F/Lt. H. H. Clarke, c. Thompson, b. Windle, 12; F/O. H. H. Storrs, c. Seward, b. Sugden, 8; S/Ldr. Portal, C.F.A., c. and b. Windle, 3; F/Lt. L. V. Hurst, retired, 43; Wing/Cmdr. P. B. Joubert de la Ferté, c. Seward, b. MacEwen, 5; F/O. J. A. Gray, c. Inglis, b. Morice, 2; F/O. C. G. Wigglesworth, c. Morris, b. Morice, 18; F/Lt. R. Halley, not out, 5; F/O. L. G. Walker, c. Inglis, b. Morris, 5; extras 13. Total, 203.

No. 7 Group.—F/O. B. C. W. Windle, c. Walker, b. Wigglesworth, 30; F/O. F. F. Inglis, c. Joubert de la Ferté, b. Wigglesworth, 10; F/Lt. A. Lees, c. Joubert, b. Gray, 23; S/Ldr. A. S. Morris, b. Storrs, 30; F/Lt. R. S. Sugden, retired, 45; F/O. W. A. Duncan, b. Walker, 1; F/Lt. C. S. Morice, b. Storrs, 7; F/Lt. T. C. Thompson, c. Fawcett, b. Walker, 9; F/Lt. W. G. Weston, c. Wigglesworth, b. Walker, 0; F/Lt. C. D. Adams, not out, 33; F/O. W. J. Seward, b. Fawcett, 17; Grp/Capt. N. D. K. MacEwen, c. Spalding, b. Joubert, 1; extras, 21. Total, 227.

BOWLING.—F/Lt. Adams, 0 for 24; S/Ldr. Morris, 1 for 33; F/Lt. Thompson, 1 for 26; F/Lt. Morice, 2 for 32; F/Lt. Weston, 1 for 24; F/Lt. Windle, 2 for 30; F/Lt. Sugden, 1 for 31; Grp/Capt. MacEwen, 1 for 7. F/Lt. Wigglesworth, 2 for 39; S/Ldr. Portal, 0 for 27; F/O. Gray, 1 for 25; F/Lt. Wear, 0 for 5; F/O. Storrs, 2 for 26; F/O. Walker, 3 for 20; F/Lt. Hurst, 0 for 13; F/Lt. Fawcett, 1 for 23; S/Ldr. Spalding, 0 for 17; Wing/Cmdr. Joubert de la Ferté, 1 for 2.

### Fencing.

FENCING.—The Royal Tournament at Olympia on May 25th the following were the R.A.F. results in the Épée v. Épée Championships.—Officers.—1, F/Lt. F. G. Sherriff, 2; S/Ldr. J. R. Walkey, 3; Wing/Cmdr. L. W. B. Rees, V.C. Other ranks.—1, Sjt.-Maj. R. E. Gorwood, 2; Sjt.-Maj. A. W. Stollery, 3; A.C.I. J. P. Griffen.

INTER-SERVICES EPEE CHAMPIONSHIP.—F/Lt. F. G. Sherriff, R.A.F., 1; Sjt.-Maj. R. E. Gorwood, R.A.F., 5. SABRE CHAMPIONSHIPS. R.A.F.—Officers.—F/Lt. F. G. Sherriff, 1; S/Ldr. J. R. Walkey, 2; Wing/Cmdr. L. W. B. Rees, V.C., 3.

Other ranks.—R.A.F.—Sjt./Maj. A. W. Stollery, 1; Sjt./Maj. R. E. Gorwood, 2; Sjt./Maj. W. M. Reid, 3.

INTER-SERVICES SABRE CHAMPIONSHIP.—Final.—Lieut. C. A. Kershaw, R.N., 1; Sjt. C. R. Potter, R.M.L.I., 2; C.S.M.I. Wyatt, Physical Training Staff, 3; F/Lt. F. G. Sherriff, M.C., R.A.F., 4.

### Uxbridge.

"M" DEPOT SQDN. SPORTS.—These Sports took place at Uxbridge on May 22nd, with the following results:—100 Yards.—AC. C. Wootton, 1; AC. Hodgson 2.

220 Yards.—AC. Hodgson, 1; AC. Wootton, 2; AC. Willetts 3. Time, 24 1-5th secs.

Long Jump.—Cpl. Bibby (17ft. 4in.), 1; AC. Willetts (17ft. 1in.), 2.

High Jump.—AC.I. Wilson (4ft. 6in.).

Putting The Shot.—L./AC. Nuthall (32ft.), 1; Cpl. Taylor (31ft. 8in.), 2.

880 Yards.—AC. Crookall, 17; AC. Brown, 2; AC. Wilson, 3. 1 Mile.—AC.I. Boland, 1; AC.I. Terry, 2; AC. C. Grogan, 3.

Serjeants' Race (100 Yards).—Sjt. Killick, C., 1; F/Sjt. Locke, O., 2.

Hurdles (130 Yards).—AC. Hodgson, 1; AC. Atkins, 2.

440 Yards.—AC. Hodgson, 1; AC. Wootton, C. 2; AC. Grogan, 3.

3 Miles.—Boland, 1; Jacques, 2; Terry, 3.

## THE COMING OF AGE OF THE ROYAL AERO CLUB.

The year 1922 being the 21st Anniversary of the formation of the Royal Aero Club, the Committee has decided to celebrate the occasion by holding a banquet at the Savoy Hotel on June 27th.

His Grace the Duke of Atholl, the President of the Club, will take the Chair.

Small tables of eight covers will be arranged, and Members wishing to make up parties must inform the Club by June 10th. The price of tickets is £1 1s. (exclusive of wines, etc.), and Members may obtain tickets for their friends (including ladies).

The Committee hopes that all Members will make a special effort to be present and early application for tickets is requested.

## ANOTHER EUROPEAN TOUR.

It so happened that a South American Stock Exchange man, Mr. W. H. Gosling of Buenos Ayres, made a hurried visit to Europe, partly for health's sake and partly business. He wished to run round all the European countries to try and solve the riddle of the exchange, and considering that his boat to America went back in a fortnight and not wishing to spend his entire time in railway carriages, he decided to go by air, and so to rug up the De Havilland Aeroplane Hire Service at Stag Lane. Within 20 minutes the whole scheme was arranged and quoted for and the following day he set off at 9 a.m. from Stag Lane Aerodrome for Paris via Croydon, piloted by Mr. Alan Cobham.

The flight to Paris passed without unusual incident except that they flew side by side with a DH18. After Paris, where they stayed two days, the route lay to Cologne, Hannover, Berlin, Vienna, Munich, Strassburg, St. Ingelvert, London. The machine used was a D.H.9c (Sidleley "Puma" engine).

The tourists arrived at Cologne in 2 hours 40 minutes, landed at the British Aerodrome, and that night went into Düsseldorf. Here they were struck by the apparent and evident prosperity of the place, and everyone seemed quite happy.

After doing business in Düsseldorf they flew on to Hannover in 2 hours and had lunch there, an excellent affair with two bottles of very fine Rhine wine. For three of them (for there was a German friend as passenger now) the bill came to 700 marks (i.e. 10s.). Food is very good and very cheap in Germany.

After lunch they flew on to Berlin in 1 hour 35 minutes, and were there in ample time for an excellent dinner. It must be remembered that flying is not in the least fatiguing to a passenger and he steps out of the bus just as fresh as when he steps in, only with a much better appetite.

At Berlin they were received with every courtesy at the aerodrome and Mr. Cobham felt that the machine was in such competent hands that he forsook his usual rule of filling and doing everything himself and allowed the German mechanics to carry on. They found that there was far more enjoyment in Berlin than in Paris. Cabarets, restaurants, dance rooms were thronged—London is a dead city compared to Berlin.

After two very enjoyable days they continued their flight to Vienna, non-stop from Berlin via Prague in 4 hours. At Vienna they were as well received at the aerodrome as in Berlin, but they found that the City was really poor, having lost its support. The passengers' impressions were that Paris was good, Berlin wonderful, but Vienna was beyond all dreams. Three great days were spent there, many purchases were made, and one afternoon there was a little aviation meeting at which Mr. Cobham demonstrated the old D.H.9c, with a few landings and one or two stalling turns, much to the delight of the Viennese aviation people.

On May 26th, the tourists set out at 5 p.m. for Munich, but could not get into the aerodrome there owing to a terrific storm in the vicinity, and so they landed in a field outside, having taken 22 hours. The next day theirs was the only machine that crossed the Black Forest owing to the fog, but by sticking to the map and hugging the contour lines along a winding route they got to Strassburg in 22 hours.

After a brief lunch they started for Calais, all over the old battlefields, which was most interesting, especially Verdun, Cambrai, Bethune, etc. They finally reached Stag Lane at 8 p.m., having been away eight days, covering over 2,000 miles with 24 hours' flying and not the slightest "snag" in any way about machine or engine. An ideal way of travelling.

MONACO MOTOR BOAT MEETING, 1922.

Remarkable Performance  
of  
**SUNBEAM-COATALEN  
ENGINES**

fitted to Despujols hulls.



"Sunbeam-Despujols IV" at full speed in Monaco Bay.

**4 FIRSTS  
3 SECONDS**

1st Race.	Coupe de Monaco. FIRST and SECOND.	Distance 50 km.
2nd Race.	Coupe de Monaco. FIRST.	Distance 100 km.
3rd Race.	Coupe de Monaco. FIRST and SECOND.	Distance 1 km. (Standing Start).
Prix de l'International Sporting Club.	FIRST and SECOND.	Distance 57.7 km.

The successful boats were "Sunbeam-Despujols V" and "Sunbeam-Despujols IV," fitted respectively with a "Matabele" 420 h.p. Sunbeam-Coatalen engine and a "Cossack" 350 h.p. Sunbeam-Coatalen engine.

THE SUNBEAM MOTOR CAR CO., LTD.,  
Moorfield Works - - - Wolverhampton.  
And at London, Manchester, and New York.



# COMMERCIAL AERONAUTICS.

## AND CIVIL AERIAL TRANSPORT.

### THE UNITED KINGDOM OF GREAT BRITAIN AND IRELAND.

#### CONTINENTAL ARRIVALS AND DEPARTURES.

[The following table of arrivals at and departures from the British Air Ports is compiled on the following system:—First, comes the initials of the Air Line; next, the type of machine; next, the international number of the machine; next, the ports of departure and destination; next, the times of departure and arrival; next, the cargo, whether goods (G) and/or mails (M); next, the number of passengers; and finally the name of the pilot and number of mechanics, if any.]

ABBREVIATIONS:—A.D.—Aircraft Disposal Co. B.A. Berkshire Aviation Co. B.C.—Bristol Aeroplane Co. C.A.—Department of Civil Aviation. D.A.—Daimler Airway. D.H.—De Havilland Aircraft Co. G.E.—Compagnie des Grands Express Aériens. H.P.—Hawley Flight Transport Ltd. I.L.—Instone Air Line. K.L.—Koninklijke Luchtvaart Maatschappij. L.L.—Lancaster Aviation Services. M.A.—Messageries Aériennes M.W.—Marconi Wireless Telegraph Co. Ltd. P.O.—Privately owned. P.L.—Pettis Ltd. S.F.—Surrey Flying Services. S.N.—Syndicat National pour l'Etude des Transports Aériens (S.N.E.T.A.).

#### The London Terminal Aerodrome, Croydon. (Telephone: Croydon 2720.)

##### MAY 22nd:

M.A., Spad, F-ACMC, London-Paris, 05.10-07.54, G., Nil, Robyn.  
L.H., DH18, G-EABR, London-Paris, 05.17-08.25, G., Nil, Jones.  
D.A., DH34, G-EBBO, London-Paris, 08.30-10.39, M., Nil, Herne & 1.  
K.L., Fokker, H-NAB1, Ldn-Adm, 10.08-12.37, G. & M., 3, Geyssendorfer.  
H.P., DH34, G-EAWH, London-Paris, 10.07-05.55, Nil, 1, Courtney.  
L.L., DH34, G-EBBT, London-Paris, 11.36-14.15, 2, Holmes.  
L.L., DH34, G-EBBT, London-Brussels, 11.38-14.58, M., 1, Powell.  
L.P., HF, G-EATH, London-Paris, 12.17-15.25, G. & M., 2, McIntosh & 1.  
D.A., DH34, G-EABR, London-Paris, 12.50-06.40, Nil, 1, Robinson.  
M.A., Spad, F-ACMB, London-Paris, 13.10-16.30, G., 2, Perignon.  
K.L., Fokker, H-NAB1, Ldn-Adm, 14.07-16.50, G., Nil, Van der Hoop.  
D.A., DH34, G-EBBO, London-Paris, 14.12-17.07, Nil, 1, Robertson.  
L.L., Westland, G-EARF, London-Paris, 16.25-19.15, G., 1, Courtney.  
K.L., Fokker, H-NAB1, Ldn-Adm, 11.22-14.10, G. & M., Nil, Sillims.  
D.H., DH18, G-EARO, London-Paris, 11.22-14.15, G., 2, Jones.  
D.A., DH34, G-EBBO, London-Paris, 11.20-13.53, Nil, 1, Herne.  
G.E., Goliath, F-GEAO, Paris-London, 11.52-14.27, G., 3, Rissler & 1.  
H.P., DH18, G-EAWH, Paris-London, 12.15-14.55, G., 2, Olley.  
M.A., Goliath, F-ADDO, London-Paris, 12.30-16.40, G. & M., 1, Coupet & 1.  
H.P., DH4, G-EAWH, Paris-London, 15.05-17.07, Nil, 1, Foot.  
L.L., DH34, G-EBBT, London-Paris, 16.07-19.20, G., 6, Holmes.  
L.L., DH34, G-EBBT, Brussels-London, 15.20-19.40, G., 6, Powell.  
K.L., Fokker, H-NAB1, Ldn-Adm, 15.10-17.47, Nil, 1, Nil, Pyl.  
D.A., DH34, G-EBBO, Paris-London, 17.10-19.47, Nil, 1, Robinson.  
D.A., DH34, G-EBBO, Paris-London, 17.40-19.49, Nil, 1, Robinson.

##### MAY 23rd:

M.A., Brequet, F-ADBM, London-Paris, 05.13-08.39, G., Nil, Revenue.  
L.L., DH34, G-EBBR, London-Paris, 05.22-08.18, G., Nil, Robins.  
D.A., DH34, G-EBBO, London-Paris, 08.28-11.02, M., Nil, Robinson.  
K.L., Fokker, H-NAB1, Ldn-Adm, 09.53-12.16, G. & M., 1, Sillims.  
H.P., DH4, G-EAWH, London-Paris, 10.07-12.30, Nil, 1, Dismore.  
L.L., DH18, G-EARO, London-Brussels, 11.37-13.40, Nil, 1, Bradley.  
H.P., Bristol, G-EAWY, London-Paris, 12.09-16.45, G. & M., 4, Carter & 1.  
D.A., DH34, G-EBBO, London-Paris, 12.37-14.52, Nil, 1, Herne.  
M.A., Goliath, F-ADDO, London-Paris, 13.45-16.50, G., Nil, Coupet & 1.  
K.L., Fokker, H-NAB1, Ldn-Adm, 14.02-16.35, G. & M., Nil, Pyl.  
D.A., DH34, G-EBBO, London-Paris, 14.49-17.08, G., 3, Hincliffe.  
G.E., Goliath, F-ADDT, London-Paris, 15.32-18.45, G., 3, Rissler & 1.  
L.L., DH18, G-EAWH, London-Paris, 16.22-20.35, G. & M., 1, Jones.  
M.A., Brequet, F-ACMB, Paris-London, 05.17-07.57, G. & M., 1, Briere.  
L.L., DH34, G-EBBR, Paris-London, 11.45-14.06, G., 6, Robins.  
G.E., Goliath, F-ADDT, Paris-London, 11.44-14.30, G., 4, Gastoux & 1.  
L.L., Westland, G-EARF, Paris-London, 12.02-14.25, Nil, 2, Courtney.  
K.L., Fokker, H-NAB1, Ldn-Adm, 12.06-15.01, G. & M., 1, Geyssendorfer.  
H.P., HF, G-EATH, Paris-London, 12.24-15.27, G., 3, McIntosh & 1.  
M.A., Goliath, F-ADAY, London-Paris, 13.09-16.45, G. & M., 1, Charrier & 1.  
K.L., Fokker, H-NAB1, Ldn-Adm, 14.36-17.45, G. & M., Nil, Van der Hoop.  
H.P., DH4, G-EAWH, Paris-London, 15.15-17.25, Nil, 2, Dismore.  
D.A., DH34, G-EBBO, Paris-London, 15.45-17.59, Nil, 4, Herne.  
L.L., DH18, G-EARO, Brussels-London, 16.13-18.50, G., 3, Bradley.  
D.A., DH34, G-EBBO, Paris-London, 17.40-19.50, Nil, 3, Robinson.

##### MAY 24th:

L.L., DH34, G-EBBR, London-Paris, 05.30-08.12, G., Nil, Powell.  
M.A., Brequet, F-ACMB, London-Paris, 05.35-08.30, G., Nil, Briere.  
D.A., DH34, G-EBBS, London-Paris, 06.01-11.55, G. & M., 5, Robertson.  
L.L., DH34, G-EBBT, London-Paris, 11.22-14.15, G., 3, Shepperson.  
L.L., DH18, G-EARO, London-Paris, 11.30-13.45, G. & M., 1, Courtney.  
K.L., Fokker, H-NAB1, Ldn-Adm, 11.57-14.20, G. & M., Nil, Geyssendorfer.  
H.P., DH4, G-EAWH, London-Paris, 12.19-14.55, M., 2, Foot.  
D.A., DH34, G-EBBO, London-Paris, 13.10-17.15, G., Nil, Charpentier.  
G.E., Goliath, F-GEAO, London-Paris, 13.25-16.30, G., 4, Gastoux.  
K.L., Fokker, H-NAB1, Ldn-Adm, 14.25-17.05, G. & M., Nil, Van der Hoop.  
D.A., DH34, G-EBBS, London-Paris, 14.25-16.50, M., 1, Hincliffe.  
C., DH5, G-EDEE, Round the world, 15.05—, Nil, 2, McMillan.

H.P., HP, G-EATH, London-Paris, 16.14-19.12, G., 2, McIntosh & 1.  
L.L., DH34, G-EBBR, London-Paris, 16.27-18.58, G. & M., 4, Holmes.  
M.A., Brequet, F-ADAY, Paris-Ldn, 05.30-08.17, G. & M., Nil, Perignon.  
K.L., Fokker, H-NAB1, Ldn-Adm, 10.31-13.22, G. & M., 1, Pyl.  
L.L., DH34, G-EBBR, Paris-London, 12.27-13.52, G., 4, Powell.  
G.E., Goliath, F-ADDT, Paris-London, 11.37-14.24, G., 1, Pavreau & 1.  
D.A., DH34, G-EBBS, Paris-London, 11.59-14.12, Nil, 1, Hincliffe.  
M.A., Goliath, F-UTMF, Paris-Ldn, 13.50-16.30, G. & M., Nil, Landri & 1.  
H.P., Bristol, G-EAWY, Paris-London, 15.22-17.53, G., 4, Carter & 1.  
K.L., Fokker, H-NAB1, Ldn-Adm, 15.20-18.23, G. & M., 2, Sillims.  
L.L., DH34, G-EBBT, Paris-London, 16.00-18.49, G., 3, Shepperson.  
H.P., DH4, G-EAWH, Paris-London, 16.01-18.11, Nil, 2, Foot.  
D.A., DH34, G-EBBS, Paris-London, 17.45-19.15, Nil, 3, Robertson.

##### MAY 25th:

L.L., DH34, G-EBBT, London-Paris, 05.20-07.40, G., 1, Robins.  
D.A., DH34, G-EBBS, London-Paris, 08.30-10.45, M., 1, Herne.  
K.L., Fokker, H-NAB1, Ldn-Adm, 10.00-12.55, G. & M., Nil, Pyl.  
L.L., DH34, G-EBBR, London-Paris, 11.52-14.55, M., 5, Bradley.  
H.P., DH4, G-EAWH, London-Paris, 12.17-15.00, Nil, 2, Olley.  
H.P., Bristol, G-EAWY, London-Paris, 12.20-15.14, Nil, 6, Rogers & 1.  
L.L., Westland, G-EARF, London-Brussels, 12.20-14.47, Nil, 1, Powell.  
M.A., Goliath, F-UTMF, London-Paris, 13.12-16.35, G., 1, Landri & 1.  
G.E., Goliath, F-ADDT, London-Paris, 14.10-17.25, G., 3, Pavreau & 1.  
P., Gordon, F-ESEG, London-Paris, 14.42-16.50, Nil, Nil, Bajac.  
A.D., DH9, G-EAXC, London-Paris, 14.55-17.00, Nil, Nil, Stocken.  
P., Spad, F-ADAR, London-Paris, 15.01-18.00, Nil, Nil, Casale.  
L.L., DH34, G-EBBT, London-Paris, 16.36-19.40, G., 6, Shepperson.  
M.A., Brequet, F-ACMB, Paris-London, 05.00-07.43, G. & M., Nil, Delage.  
L.L., DH34, G-EBBR, Paris-London, 08.28-10.40, G., Nil, Holmes.  
K.L., Fokker, H-NAB1, Ldn-Adm, 11.03-13.59, M., 2, Hofstra.  
L.L., DH34, G-EBBT, Paris-London, 11.20-13.49, G., 3, Robins.  
G.E., Goliath, F-GEAO, Paris-London, 11.32-14.51, G., 1, Grassett.  
M.A., Spad, F-ACMC, Paris-London, 11.40-14.07, G., 3, Robyn.  
D.A., DH34, G-EBBS, London-Paris, 12.30-14.15, Nil, 1, Herne.  
P., Gordon, F-ESEG, Brussels-London, 12.16-14.13, Nil, Nil, Bajac.  
P., Spad, F-ADAR, Brussels-London, 12.38-14.37, Nil, Nil, Casale.  
A.D., DH9, G-EAXC, Brussels-London, 12.45-14.25, Nil, Nil, Stocken.  
M.A., Goliath, F-ADAY, Paris-Ldn, 13.45-16.40/40.47, G. & M., Chailoux & 1.  
H.P., HP, G-EATH, Paris-London, 12.10-15.05, G., 9, McIntosh & 1.  
H.P., DH4, G-EAWH, Paris-London, 16.13-18.44, Nil, 2, Olley.  
L.L., DH34, G-EBBR, Paris-London, 16.25-19.12, G., 3, Bradley.  
L.L., DH18, G-EARO, Brussels-London, 16.27-19.40, G., 5, Courtney.  
L.L., Westland, G-EARF, Brussels-London, 16.49-19.20, Nil, Nil, Powell.

##### MAY 26th:

D.H., DH9, G-EBZC, London-Paris, 05.55-18.10, Nil, Nil, Wilson.  
M.A., Brequet, F-ACMA, London-Paris, 05.59-10.50, G., Nil, Delage.  
M.A., Brequet, F-ADAY, London-Paris, 06.00-11.00, Nil, Jones.  
K.L., Fokker, H-NAB1, Ldn-Adm, 12.00-16.10, G. & M., 1, Sillims.  
D.A., DH34, G-EBBS, London-Paris, 12.29-10.06, M., 4, Herne & 1.  
L.L., Westland, G-EARF, Ldn-Brussels, 12.12-14.46, G. & M., 1, Courtney.  
L.L., DH18, G-EARO, London-Paris, 12.26-15.16, G. & M., 4, Holmes.  
G.E., Goliath, F-GEAO, London-Paris, 16.25-19.10, G., Nil, Grassett & 1.  
L.L., DH18, G-EAWH, Paris-Ldn, 16.38-18.50, G., 5, Robins.  
K.L., Fokker, H-NAB1, Ldn-Adm, 05.25-10.47, G. & M., Nil, Hofstra.  
H.P., HP, G-EATH, London-Paris, 17.48-20.15, G. & M., 2, Wilcockson & 1.  
M.A., Goliath, F-ADCA, Paris-London, 14.40-19.53, G. & M., 1, Le Sec & 1.  
L.L., DH34, G-EBBR, Paris-London, 15.09-18.20, Nil, 6, Gastoux & 1.  
L.L., DH34, G-EBBT, Paris-London, 14.05-16.39, G., 3, Shepperson.  
H.P., Bristol, G-EAWY, Paris-London, 14.10-17.27, Nil, 7, Rogers & 1.  
K.L., Fokker, H-NAB1, Ldn-Adm, 14.33-17.40, Nil, 1, Geyssendorfer.  
D.A., DH34, G-EBBS, Ldn-Adm, 14.47-17.48, G. & M., Nil, Van der Hoop.  
L.L., Westland, G-EARF, Brussels-London, 16.27-19.06, G., 2, Courtney.  
L.L., DH18, G-EARO, Paris-London, 16.55-19.39, G., 2, Holmes.  
D.A., DH34, G-EBBS, Paris-London, 16.59-20.07, Nil, 6, Hincliffe.  
L.L., DH34, G-EBBR, Paris-London, 18.22-20.50, Nil, Nil, Jones.

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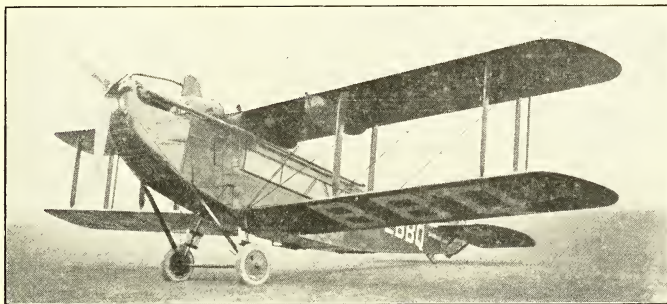
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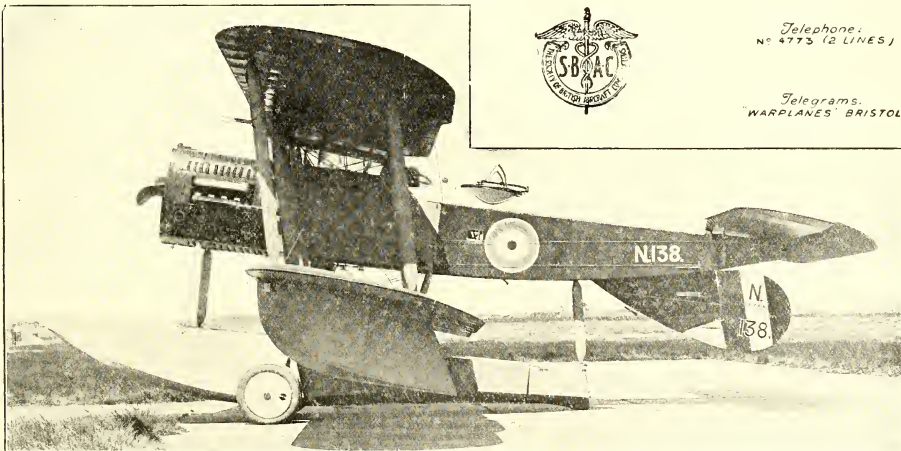
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## MAY 27th:

M.A., Breguet, F-ADAU, London-Paris, 05.29-10.45, G. & M., Nil, Perignon.  
 I.L., DH34, G-EBBT, London-Paris, 09.29-10.45, G. & M., Nil, Bradley.  
 D.A., DH34, G-EBBS, London-Paris, 09.00-11.00, M. & N., Robertson & I.  
 K.L., Fokker, H-NABN, Ldn-A'dam, 10.02-12.35, G. & M., Nil, Geyssendorfer.  
 I.L., DH34, G-EBBT, London-Paris, 11.42-13.50, G. & M., 2, Powell.  
 H.P., DH18, G-EAWX, London-Paris, 12.13-14.30, G. & M., 6, Carter.  
 I.L., DH18, G-EARO, London-Brussels, 12.24-14.45, G. & M., 1, Shepperson.  
 M.A., Goliath, F-ADAY, London-Paris, 13.15-15.55, G. & M., 4, Challons & I.  
 K.L., Fokker, H-NABD, Ldn-A'dam, 15.36-18.15, G. & M., Nil, Van der Hoop.  
 G.E., Goliath, F-ADDS, London-Paris, 14.32-17.25, G. & M., 7, Riser & I.  
 D.A., DH34, G-EBBS, London-Paris, 15.09-17.20, M. & N., Herne & "one."  
 I.L., DH18, G-EAWW, London-Paris, 16.31-19.13, G. & M., 4, Jones.  
 K.L., Fokker, H-NABN, A'dam-London, 10.24-13.07, G. & M., Nil, Pyl.  
 I.L., DH18, G-EAWW, London-Paris, 11.34-14.10, G. & M., 6, Robbins.  
 G.E., Goliath, F-ADPE, Paris-London, 11.59-14.25, G. & M., 3, Fairman & I.  
 D.A., DH34, G-EBBS, Paris-London, 11.57-14.25, Nil, 4, Robertson & I.  
 H.P., H.P., G-EATH, Paris-London, 12.27-15.34, G. & M., 2, Wilcockson & I.  
 K.L., Fokker, H-NABD, London-Paris, 13.55-17.40, G. & M., Nil, Stillins.  
 M.A., Spad, F-ADAF, Paris-London, 16.09-20.10, G. & M., 5, Portal.  
 I.L., DH34, G-EBBT, Paris-London, 16.15-18.50, Nil, 3, Bradley.  
 I.L., DH18, G-EARO, Brussels-London, 16.21-18.54, G. & M., 2, Shepperson.  
 M.A., Goliath, F-FAEH, Paris-London, 16.45-20.15, G. & M., 6, Dorr & I.  
 D.A., DH34, G-EBBS, Paris-London, 17.55-20.17, Nil, 2, Herne & I.  
 D.H., DH9, G-EAYC, St. Ingouven, 16.55-20.00, Nil, 1, Cobham.

## MAY 28th:

M.A., Spad, F-ADAF, London-Paris, 06.22-14.05, G. & M., Nil, Portal.  
 H.P., DH4, G-EAWH, London-Paris, 12.05-12.20, Nil, 2, Olley.  
 H.P., H.P., G-EATH, London-Paris, 10.17-13.05, Nil, 9, Rogers & I.  
 D.A., DH34, G-EBBS, London-Paris, 11.30-13.49, Nil, 2, Robertson & I.  
 I.L., Westland, G-EARF, London-Paris, 11.40-14.50, Nil, 2, Courtney.  
 M.A., Goliath, F-FAEH, London-Paris, 13.00-15.15, G. & M., 3, Dorr & I.  
 M.A., Breguet, F-CMAB, Paris-London, 15.05-18.00, G. & M., Nil, Briere.  
 I.L., DH34, G-EBBT, Paris-London, 11.35-14.11, G. & M., 5, Powell.  
 D.A., DH34, G-EBBS, Paris-London, 14.50-16.48, Nil, 2, Robertson & I.  
 I.L., DH18, G-EAWW, Paris-London, 15.50-18.26, G. & M., 4, Jones.  
 H.P., DH18, G-EAWX, Paris-London, 16.25-18.50, G. & M., 3, Carter.

## Inland Flying at Croydon.

May 22nd.—M.W./T.Co., Avro, tests (Shaw); S.F., Avro, Joy-rides (Muir).  
 May 23rd.—D.A., D.H.34, tests (Dickinson); S.F., Avro, Penhurst (Muir).  
 May 24th.—S.F., Avro, Joy-rides (Muir).  
 May 25th.—S.F., Avro, Joy-rides (Muir); D.M., D.H.9, from Stag Lane (Wilson); K.L., Fokker, test (Stillins).  
 May 26th.—M.W./T.Co., Avro, test (shaw); I.L., D.H.18, test (Powell); H.P., D.H.4, Cricklewood (Foot).  
 May 27th.—S.F., Avro, Newbury (Muir); Avro, Beckenham (Muir); Avro, Joy-rides (Muir); M.W./T.Co., test, Avro (Shaw); H.P., D.H.18, test (Carter).  
 May 28th.—S.F., Avro, Joy-rides (Muir); B.A.C., Bristol, Bristol return (Uwins).

## Cross-Channel Statistics.

Week ending May 28th 1922:  
 Machines, 32; Passengers, 337; Crews, 196; Total Personnel, 533  
 Corresponding week last year—  
 Machines, 80; Passengers, 350; Crews, 106; Total Personnel, 496  
 Corresponding week, 1920—  
 Machines, 31; Passengers, 138; Crews, 68; Total Personnel, 236

## The London Terminal Aerodrome.

Capt. Stocken has been testing various D.H.s during the week, including that on which Wilfred & Co. have reached France in their adventurous flight. The "three gallant gentlemen" started off at 15.00 hours on Wednesday, a large crowd having collected to watch the event.

A certain gentleman has recently started to walk round the world. One is assured by Mr. Shaw that he is walking ahead of Wilfred and Co. to place spurs, etc., for them.

Capt. Stocken was also testing the D.H. 9a for Le Bourget, with which he later "broad casted" the Morane.

There has been plenty of flying at the aerodrome all the week and the passengers seem on the increase.

Mr. Dickinson has been flying very well on the D.H.34 and making excellent landings. On Monday, as he was putting in some landings, he and Mr. Robinson, who was coming in from Paris on another 34, somewhat cock-tailed the two machines.

Mr. Hamilton-Youell, who has been for some time in Sweden, doing much flying, has joined the Instone Air Line as a pilot, as has also Mr. MacMullin, who has just returned from China.

Handley Page Transport have been strengthening the undercarriage of the W8Bs so as to eliminate the undercarriage shedding epidemic, which has been somewhat prevalent at Croydon lately.

On Sunday, Mr. Rogers had Miss Gladys Cooper as passenger in the nose of an O/400, and she duly returned on Monday.

Mr. Muir has been taking many passengers in the Avro, including one on Sunday to Bournemouth, whom he landed actually in the grounds of an hotel.

The Daimler Airway have been doing the double-double journey between Paris and London with a single machine, except when prevented by weather. The way the Napier engine stands it seems to show that Col. Searle's policy is justified. As one has travelled in the front of this machine three times during the past week, one can testify to the fact

that the Napier shows no signs of vibration or over-heating, and in spite of all runs as sweetly as ever.

The competitors in the Coupe Lanblin landed at Croydon on Thursday afternoon and got away again without incident.

As one has been at Le Bourget during the greater part of the week, these notes are naturally somewhat attenuated.—G. D. [D. G.—Ed.]

## Travel by Air.

When anyone has once been to Paris by air and realised the comfort, speed, reliability and safety of this mode of transport, it seems quite inconceivable that they should wish to travel any other way.

During the past week-end one has, by courtesy of the Daimler Airway and the Instone Air Line, made several trips between the two capitals, and can therefore testify personally to the excellence of the organisation, both in Paris and London, of these two lines.

On Thursday at 08.30, one left Croydon on a Daimler D.H.34, G-EBBS, piloted by Mr. Herne. There had just been a big storm and there was much lightning going, but Mr. Herne has a way with him when such phenomena are about, and make the most ferocious atmospheric lie down and purr.

As we passed over Tonbridge we got into clear weather which the Meteor people kindly provided on the rest of the route. The Channel was crossed from Dungeness to Etaples, and Le Bourget was reached without event, in almost exactly the scheduled 125 minutes. As we landed Captain Stocken was just taking off in his D.H.9a for the Coupe Lanblin.

The following evening Mr. Roche, the Paris manager of the Instone Air Line, kindly allowed one to travel back in D.H.18, G-EARO, piloted by Mr. Cyril Holmes. Against a strongish head wind we made the trip in 2 hrs. 35 mins., making a crossing at over 5,000 ft. from the mouth of the Somme to Hastings in very clear weather, and having a very amusing trip through Sussex, Kent and Surrey.

At 15.00 on Saturday, once again one crossed in the Daimler D.H.34, G-EBBS, piloted by Mr. Herne, and made the same crossing, but in glorious weather, reaching Paris in 2 hrs. 15 mins.

On Sunday one left again on the same machine, piloted by Mr. Robertson, and crossed from Etaples to Dungeness. Coming up through Kent we came down low over Tonbridge to get some photographs of the school, which looks very fine from the air. We landed at Croydon after just over two hours' flight.

One has to thank all the Paris air line managers for their help during one's stay there, particularly Mr. Hinchliffe, of the Daimler Airway, Mr. Roche, of the Instone Air Line, and Mr. Macintosh of Handley Page Transport.

One gathers that all the British air line people at Le Bourget much appreciate all that M. Renvois, the commandant, is able to do for them, and one learns that much of the friction that has occurred in the past has been purely the result of misunderstandings. After all, rules are rules, and one believes that M. Renvois is always willing to allow pilots to do pretty well as they like if only they tell him about it first.

M. Renvois is certainly making Le Bourget into a very fine air-port, and when it is finished it will be the best of its kind in the World.—G. D.

## Tiverton, Devon.

On May 13th last one of the B.A. Co.'s Avros arrived here from Wells in order to give the townspeople a ten days' flying visit. The flight from Wells occupied only 35 minutes and crowds awaited the arrival of the machine.

A start was made on Sunday morning and flying continued all day until dusk. Messrs. J. D. V. Holmes and J. C. Taylor "walked the wings" in an evening before 3,000 people amid much applause. The machine was also kept busy on Monday, especially in the evening.

The firm has now brought its grand total of passengers carried to 33,700.

## Wells-Somerset.

The Berkshire Aviation Co., Ltd., finished a highly successful visit here on Wednesday, the 14th May. Mr. A. L. Robinson was piloting the firm's Avro G-EAKN, and on Saturday carried 155 passengers. This is claimed as the record for one pilot with one machine in a single day. The engine was kept running continuously from 14.30 hours till 21.00 hours, only stopping to fill up with petrol.

Half the proceeds of the gate was given to the Wells Cottage Hospital on the same day, a sum of £80.3s.3d. being realised.

Aviation has been the principal topic in the City and more than 800 applications were received for 10 free flights.

The Bishop of the Diocese went up on two occasions—to see



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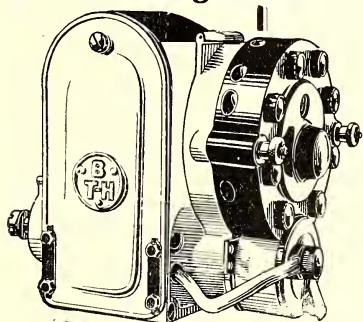
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First Flight across Atlantic (by Airship R.34).  
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First and Second Places secured in Aerial Derby.

1920—World's Record for useful load carried, height and  
duration.  
British Speed Record (166½ miles per hour).  
Secured five out of eight prizes awarded in Air Ministry  
Trials at Martlesham Heath.  
First and Second Places in Aerial Derby.

1921—First, Second and Third Places secured in Aerial Derby.  
Also First and Second Handicap Prizes.

**B.T.H. Magnetos also helped to create the latest Speed  
Record held by the Gloucestershire Mars**



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his palace—and the Cathedral from the air; and many cross-country flights were made to Glastonbury, Shepton Mallet, Filton, and Weston-Super-Mare.

## PERSONAL NOTICES.

### DEATHS.

**BEALE.**—On May 26th, after operation on head wound received in Salonika in May, 1917, Norman Sydney (Lieut., M.C., Légion d'Honneur, 2nd Batin, East Surrey Regt. and R.A.F.), of Kingsdown, Burwash, Sussex, eldest son of the late Sydney E. Beale, A.R.I.B.A., and Elizabeth Beale, of Sutton House, Sutton, in his 26th year.

**GREEN-STIVEN.**—On May 24th, at Digby, Lincolnshire, as the result of a flying accident, F/O Ernest George Green, M.C., and Sgt. W. J. Stacey of No. 2 Sqdn., R.A.F.

**HOOTON.**—Killed whilst on service West of Baghdad, Mesopotamia, on May 16th, F/O Lionel C. Hooton, son of the late Stanley Hooton, and of Kosa Hooton, Fermaine, The Grange Drive, Winchmore Hill, in his 33rd year.

**THOMPSON.**—On May 2nd, as the result of a flying accident at Shotwick, near Chester, AC2 Thompson, R.A.F.

### ENGAGEMENTS.

**FETHERSTON-FORBES-PHILLIPS.**—The engagement is announced between Stanley John Fetherston, D.F.C. (late Captain R.A.F. and R.N.A.S.), younger son of Mr. and Mrs. J. F. Fetherston, Sandhurst, Hutton, Essex, and Elizabeth Jane Aytton Forbes Phillips, younger daughter of the late Forbes Phillips, Vicar of Gorseston, Suffolk.

**GREENFELL-BLIGHT.**—A marriage has been arranged, and will take place early in June, in Cairo, Egypt, between F/Lt. E. B. Grenfell, R.A.F., son of Dr. H. O. Grenfell, of Roschill, Saltsay, and Marion G. Blight, daughter of Mr. and Mrs. J. P. Blight, Chiswick, Hants, Collington, Cornwall.

### BIRTHS.

**ATKINSON.**—On May 21st, at Casablanca, Morocco, the wife of G. M. Atkinson, late R.A.F.—a daughter.

**MCCALMAN.**—On May 25th, at Aston Grays, Bournemouth, to Ruth, wife of the Rev. H. McCalmann, M.C., R.A.F.—a daughter.

**MEGGITT.**—On May 15th, to F/Lt. and Mrs. W. G. Meggitt, R.A.F.—a son.

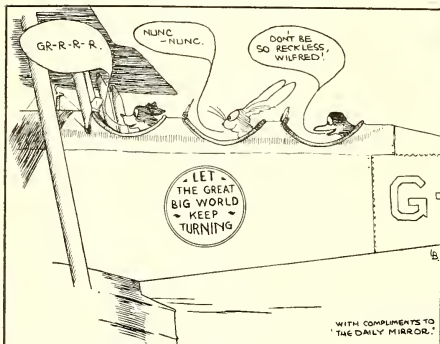
**SMITH.**—On May 11th, at Cowdrys Farm, East Hendred, Berks, to Winc/Comdr. and Mrs. C. Garner Smith—a son.

## A DANGER AREA FOR AIRCRAFT.

The Air Council announce that artillery practice at irregular intervals on Yantlet range (Isle of Grain) forms a danger to aircraft over an area extending across the mouth of the Thames from Yantlet to the north-east extremity of Foulness Sand. When firing is in progress a ground signal will be displayed on Grain Aerodrome.

[The danger is that the guns will not be firing at the aeroplanes.—Ed.]

## THE ADVENTURES OF MAC, BROOME AND WILFRED—II.



MY DEAR PILOTS AND GROUND WALLAHs,—

As you see Mac, Broome and Wilfred have started safely on their adventurous tour. You will be pleased to know that they had a great send off at Croydon and all were pleased to see Wilfred disappearing in the distance.

Mac did not seem to like the crowd and growled ominously, and Broome did not seem too pleased, but Wilfred squeaked with delight to see the Wilfred Protection League in such large numbers and was photographed in all positions.

Among the pets' toys was a charm which Wilfred showed to the crowd and told them it had been blessed by the Pope. And someone in the crowd—I am not shaw who—said "and seconded by Colonel Bristow." It did make people laugh.

They arrived in three hours at Bourget and proceeded to take the tail of the machine off because it was tail-heavy. Then they put it back again with the help of the Aircraft Disposal Company, which disposed of their troubles. They then visited Paris and the "Folies Bergères," which caused Wilfred to "Nunc Nunc" with pleasure.

On Friday, Wilfred was to be presented to the President at le Bourget, but at the critical moment Wilfred got mislaid, and the President went home to his Elysian Palace. Wilfred ran after him over so hard, but could not catch him, and then he was unable to get into the presence of the great man.

On Saturday morning, the pets started off again and on Sunday they reached Marseilles, where they hurt their aeroplane, breaking the prop and the undercarriage.

So there we will leave them till next week where they probably still will be.

Your affectionate Uncle,—G. D.

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Probably the great value of the accuracy of the Cinema record has never before been so prominently brought to the knowledge of the public; but from the beginning of 1915 its accuracy has been utilised in the study of the successive developments of

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Many thousands of feet of film were used by Mr. Calthrop with his Aerosec Cinema Cameras during the experimental tests, and one by one small irregularities of action were detected by means of the film, and permanently eliminated. It was thus that its ultimate machine-like action—always doing the same thing in the same way each time—was attained. No other inventor of parachutes has taken the trouble or cared to incur the cost of employing this scientific method of investigation. Mr. Calthrop's inventions are of prime importance and are everywhere covered by his patents.

But to come to business. Do you want a parachute upon whose machine certainty of action you can rely every time you have to use it, or will you be content with one whose action is uncontrolled, variable and freakish? Think what variability of action means, and count its possible cost *someday* to yourself.

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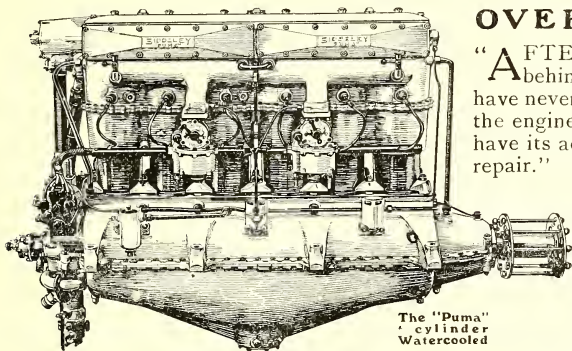
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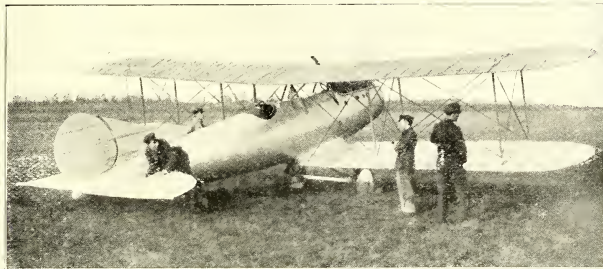
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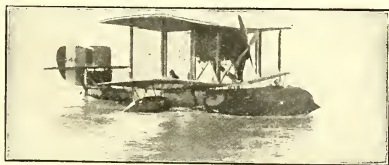
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# THE AEROPLANE

WEDNESDAY, JUNE 7, 1922.

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P. G. Grey

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SIXPENCE WEEKLY.

[Registered at the G.P.O.  
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## FROM ARGENTINA TO BRAZIL.



BRITISH PIONEERING.— Major Kingsley and three Argentine Bankers at Porto Alegre, Brazil, whither they had flown in the D.H.a. (Rolls-Royce Engine) belonging to the River Plate Aviation Company. Major Kingsley is now in England considering new machines.

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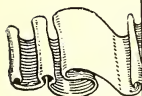
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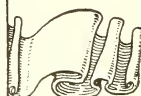


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## ON THE R.A.F. GATHERING.

During the past week notices have been sent out to the newspapers of Great Britain, metropolitan and provincial, to the effect that a great gathering of past and present members of the R.A.F., is to be held, with the highest official approval, on Friday night, June 23rd, the eve of the R.A.F. Pageant. The daily Press, which is now particularly interested in our First Line of Defence, has already published preliminary announcements but some papers will probably not even do this much. Therefore it seems necessary to explain in this paper rather more than readers of the ordinary news-sheets are likely to learn.

The scheme for a general gathering, consisting of a number of simultaneous dinners of R.A.F. units, actually originated with Wing-Commander Christie, D.S.O., M.C., now our Air Attaché in Washington. His appointment to that post prevented him from completing the organisation himself and his good work is being ably carried on by another officer (who desires to remain anonymous) and a committee of past and present R.A.F. officers.

The underlying idea is, of course, to keep former R.A.F. people—both officers and other ranks—in touch with one another and with those still serving to-day. One never knows when we may be lured into another war, and if such a thing should happen within the next ten years naturally all the former R.A.F. people will join their old Service. Therefore it is as well that they should be in touch with present-day R.A.F. people. Over and above that there is for the ex-R.A.F. officer or man the personal pleasure of meeting at such a gathering as this the people with whom he worked and fought during the War, and of renewing old associations.

### The Great Date.

The eve of the Pageant has been fixed as the date so as to give both past and present R.A.F. people the best chance of meeting. Present R.A.F. officers and men are more likely to get leave to come up to Town for the Pageant than for any other reason, and as the gathering on the previous evening is officially approved it seems unlikely that Commanding Officers will refuse the extra half-day necessary to enable people to get to Town in time on the Friday.

And as to past R.A.F. people, this date was fixed because there are in these hard times many officers and men who cannot afford a railway fare to Town and a hotel bill either for the Pageant alone or for a Squadron or other unit dinner alone. At any rate there are very few of them who can afford to attend both events. Therefore this arrangement will give them the chance of killing two birds with one stone, or pulling off the double event, for one railway fare and one hotel bill. A man can come up to Town on Friday afternoon, attend the gathering, do the Pageant next day and go home that night, or on Sunday. Thus he will only lose two half-days of work.

Admittedly the night of the Pageant itself would be a better date but experience has shown that it is physically impossible to get away from Hendon in time for dinner. Consequently the previous night is the best possible. Moreover this gives people the opportunity of meeting their friends from their own unit on this night by arrangement and of meeting "the rest" by chance at Hendon next day.

Thus it is hoped to get together many hundreds of people who served in the R.N.A.S., R.F.C., and R.A.F., who have not met for years, and to re-establish old friendships which have lapsed during the past three and a half years of devastating peace.

### The General Scheme.

The general scheme of the gathering is as follows:—

Anyone who wishes to attend is asked to write to the Honorary Secretary of his former unit at Room 651, The Air Ministry, Kingsway, W.C.2, giving his rank and enclosing a stamped addressed envelope for reply.

If his particular unit has already an organisation which has run dinners in the past—as for example, 100 Squadron, No. 8 Naval, Engine Repair Shops, and so forth—his letter

will be handed over to the Secretary of that unit organisation, who will in due course give him full information as to the hour, place, and price of that unit's gathering.

If his unit has no organisation of this sort—as appears unhappily to be the case with the historic First Four Squadrons, R.A.F.—then the Organising Committee will sort out the applications into their respective units. If any unit has sufficient applicants to justify its having a dinner of its own, then somebody will be found from that unit to manage the affair. In several cases officers who have commanded squadrons which have never had a gathering have offered to take the chair if enough applicants are forthcoming.

For the benefit of people belonging to units from which there are not enough applications to make a separate unit dinner possible—suppose for example there were only three or four belonging to one squadron or half a dozen from one aircraft depot—there will be two big general dinners (one for officers and one for other ranks) run by the Organising Committee, and at these people will be seated together according to their units, perhaps a table for a dozen from one unit, or two or three from one unit at a table with others of a similar unit.

What will happen after the dinner is largely a matter for the diners themselves. Probably many of them will foregather at the R.A.F. Club. In some cases it is proposed that the party from one unit shall call *en masse* on another unit with which it was friendly through serving on the same aerodrome or in the same war area. But in any case it is certain that the diners will be thoroughly jolly affairs.

### How to Help.

It is earnestly hoped that the gathering, which is of course purely experimental this time, will be such a success that it will become an annual social event analogous to the University Boat Race or Rugby nights at which University men from all over the world foregather and make merry. Therefore one appeals to all readers of this paper who have served in the R.A.F. to help to make it the success it deserves to be.

Everybody who has served in the Flying Services has maintained contact with some of his old formation and he can help the affair by writing round to all these and insisting on their coming along with him. All to whom one has mentioned the scheme are enthusiastic about it. One young officer now in business guarantees to collect six others at least who served with him in a squadron which has never yet had an annual gathering. If every other ex-R.A.F. reader does the same it seems that the Organising Committee will have a pretty big task before it. Which is precisely what would best please the said Committee.

In the cases of officers and men who have served in several units, as most of them have done, it is to be assumed that they will address their letters to the Secretary of the unit in which they made the most friends, or alternatively to the most distinguished unit with which they served. One ventures to suggest that it might be a good idea for an applicant to mention in his letter some alternative units so that if there are not enough people from one unit to make a unit dinner he can join another.

### Railway Arrangements.

It may be well to remind people who are coming up to Town for the double event that it is now possible to buy week-end railway tickets at, one believes, a fare and a third. These are issued after 17.00 hours on Friday, so that anybody who lives within a couple of hours' run of London can have the advantage of this reduced fare, which must, however, exceed 15s. in amount.

If a man who lives too far away for this wants to be clever he can travel part of the way on an ordinary ticket and re-book after 17.00 hours. This involves some study of timetables, but it is well worth while in many cases, especially



if he is bringing his better half with him for the Pageant next day and so can double the saving.

As a matter of fact the Railway Clearing House was asked whether these week-end tickets could not be made available from mid-day on Friday for people showing tickets for the R.A.F. gathering, but the suggestion was rejected, which only shows one the advantage of a ring or a monopoly such as the railways have.

Probably, therefore, many people will come by road, and one hopes that at the fourth or fifth Annual R.A.F. Gathering a number will travel by air.

#### To Assure Success.

Be that as it may, the great thing is to make this first R.A.F. gathering a real success, a worthy preliminary to the R.A.F. Pageant. Everybody who is or has ever been anybody in the Flying Services ought to be there. One hopes to hear afterwards that exalted officers who were mere one-

stripes and two-stripes in the Navy or subalterns or captains in the Army at the outbreak of War have been dining with units in which they served or which they commanded in those early days and that flying-officers and flight-lieutenants of the few R.A.F. units which still exist were also there, just as at an annual regimental dinner in the Army one finds half a dozen or more General Officers who once served in that regiment dining with the officers of to-day.

Therefore again one asks all former R.A.F. personnel to write "The Hon. Secretary, 'X Unit,' Room 651, The Air Ministry, Kingsway, W.C.2"—the "X" representing the squadron or other unit number of the applicant—giving rank and alternative units; and not forgetting the stamped addressed envelopes, for the Committee is purely honorary and has no organisation funds. Thus the R.A.F. Gathering may become an event of an importance commensurate with the importance of the First Line of Defence.—C. G. G.

### BIRTHDAY HONOURS.

The following recipients of The King's Birthday Honours, whose names appeared in the list published on June 3rd, have some aeronautical interest:—

#### PEERAGE.

SIR SAMUEL JAMES WARING, BART., is generally understood to have obtained his Baronetcy in connection with aviation, having been the moving spirit in Waring & Gillow's aircraft factory, the Alliance Aircraft Co., The British Aerial Transport Co., The British Nieuport Co., and the A.P.C. Engine firm. The B.A.T. Co. under Mr. Koolhoven and the Nieuport Co. under Major Ickelsall-Smith and Mr. Folland attained to considerable eminence. The A.B.C. firm is now chiefly concerned with making automobiles, though one believes that it still has a large unsettled claim against the Government in respect of the Dragonfly engine, which unfortunately was unusable during the war. The various aircraft firms still exist but are in a state of suspended animation, except that the Nieuport Co. has like the A.B.C. Co. entered a claim to be pecuniarily rewarded by the Government for what the Nighthawk was capable of doing.

Sir Samuel Waring is described in the *Morning Post* as a Director of the Duchess of Sutherland's Cripples' Guild, a member of the Executive Committee of the National Association of Ex-Soldiers, a pioneer of decorative art in furnishing, an active supporter of the Boy Scout movement, a founder of the Higher Production Council and a generous supporter of charities. One may add that he has been associated with Mr. H. V. Roe and others in bringing masters and men more closely together and one gathers that representatives of both parties have together spent pleasant week-ends in conference at his sumptuous residence.

Though apparently his peerage has not been obtained in connection with aviation Sir Samuel can at any rate claim to be the first Jewish peer to be connected with aviation.

#### ORDER OF THE BATH, K.C.B.

WALTER FREDERICK NICHOLSON, C.B., Secretary to the Air Ministry. Mr. Nicholson came to the Air Ministry from some other Government Department. The Secretariat department of the Air Ministry is steadily approximating in efficiency to the standard of the older Government Departments and doubtless this is Mr. Nicholson's reward.

### THE HELICOPTER CRAZE.

Various papers have published a tale about the Brennan helicopter which runs more or less as follows:—

"Secret tests carried out with the British Brennan helicopter have been so successful that it is probable that the Air Ministry will not pursue its proposal to offer £50,000 for such a machine.

"The Brennan craft has fulfilled every condition that it was intended to attach to the offer of the authorities. The achievement marks a far-reaching step in aeronautics.

"The British helicopter has been designed and constructed, with Government aid, by Mr. Louis Brennan in the large airship shed at South Farnborough, Hants. The utmost secrecy has surrounded the work, and precautions as elaborate as those to safeguard the evolution of the tank against intruders have been taken.

"The Air Ministry required a helicopter that could

(a) Rise to a height of 2,000 ft. under its own power, carrying a pilot and sufficient fuel for one hour's flight.

(b) Hover stationary for half-an-hour in a wind of 20 miles an hour.

(c) Descend in a wind of 20 miles an hour with the engine cut out, without horizontal motion.

(d) Fly horizontally at a speed of 50 miles an hour.

"These severe tests were believed to represent the standard which the perfected practical machine should be able to satisfy. Each one has been fulfilled by the Brennan machine.

"The invention will revolutionise flying. It makes possi-

BRIG.-GENERAL FREDERIC HERBERT WILLIAMSON, C.B.E., Assistant Secretary to the Post Office. Took part in the Air Conference as representing the Postmaster-General. Has since been concerned frequently with matters affecting air mail services. Aeronautical people are likely to hear more of him in the future.

#### ORDER OF THE BRITISH EMPIRE, K.B.E.

Lieut.-Colonel ALAN HUGHES BURGONNE, M.P.—Was formerly a moving spirit in the Navy League. In the early days of aviation he offered a cup for the first flight across London. More recently he has been honorary secretary to that association of Members of both Houses of Parliament which was formed to keep an eye on the development of aviation. Not long since he very nearly became commercially concerned with aircraft. He may still be very valuable in helping aeronautical developments.

EDWARD MAUGER LIFFE.—Now senior member of the firm of Liffe and Sons, Ltd., of Coventry, proprietors of *The Autocar, Motor Transport* and many other publications. With the late Walter Staner, then editor of *The Autocar*, he was chiefly responsible for the founding of *The Aero* by Liffe and Sons, Ltd., in 1909. Thus he may be regarded as to a very great extent as the stepfather of THE AEROPLANE. To him and to his late father one owes much personal gratitude for one's introduction to newspaper work, and one is correspondingly glad to be able to congratulate him and Lady Liffe on his well-deserved knighthood, which one gathers is officially conferred because he has "devoted much time to hospital, municipal, and local public work." One prefers to think that it is really because of the great work which his publications have done for mechanical transport.

#### C.B. (MILITARY DIVN.).

Air Commodore JOHN MILES STEEL, C.M.G., C.B.E., Royal Air Force.

#### AIR FORCE AWARDS.

##### SECOND BAR TO AIR FORCE CROSS.

Flight Lieutenant PAUL WARD SPENCER BUIMAN, M.C., A.F.C.

##### AIR FORCE CROSS.

Flying Officer WILLIAM FORSTER DICKSON, D.S.O.

Flying Officer ARTHUR GORDON JARVIS.

Flying Officer AUBREY ROBERT MAXWELL RICKARDS.

ble the utilisation of houses and business premises, and the ground of mansions and hotels as landing places. Air stations can be in the cities instead of away from the centres of population.

"For military purposes, too, it will be almost invaluable since it can hover over any given spot, and is practically invisible because of the blurring effect of the large rotating surfaces which keep it up."

One is informed by competent officials at the Air Ministry that these tales are grossly exaggerated and that the Air Ministry's contemplated offer of a prize still stands.

Mr. Brennan himself admits that his machine has never left its shed.

Personally one has no faith in the helicopter as such, and one does not believe that Mr. Brennan—or anybody else, for that matter—will produce a useful vehicle on such lines. Mr. Brennan's earlier inventions, his torpedo and his monorail, have failed to be of practical use in their respective spheres, and one regards his helicopter as merely another of such brilliant failures. One has not yet discovered why Mr. Brennan should be financed by the Government in preference to any other inventor.

If these continual rumours about the Brennan helicopter are being circulated by Mr. Brennan's friends in the hope of forcing the Government to continue subsidising him, one can only say that they are pursuing a policy which is likely to do more harm than good.—C. G. G.

### THE PORTUGUESE ATLANTIC FLIGHT.

On Monday, June 5th, Com. Sacca-lira Cabral and Capt. Gago Coutinho arrived at Pernambuco from Fernando Noronha shortly after midday, having completed this stage in 3 hours 55 minutes. By this flight the two aviators have succeeded in flying across the Atlantic from Lisbon, and they are continuing the flight to Rio de Janeiro where they expect to arrive between June 12th and 15th.

It will be remembered that they left Lisbon on March 30th on a special Fairey seaplane (360 h.p. Rolls-Royce "Eagle") and after stops at the Canary Isles and Cape Verde Isles reached St. Paul's Rocks, 500 miles from the Brazilian coast, where they descended, the seaplane being damaged by the heavy seas.

A second machine, a standard Fairey IIIc (Rolls-Royce "Eagle"), was sent out from Lisbon, and in attempting to complete the flight they were forced to descend, and were picked up by the British steamer. A third Fairey seaplane also a standard IIIc was sent out from Lisbon, and it is on this machine that they have reached Pernambuco, and are continuing their flight to Rio de Janeiro.

Though no information is available on the point it is to be assumed that they started from Fernando Noronha and flew to St. Paul's Rocks and back before going on to Pernambuco. This was their expressed intention some weeks ago, and unless they did so they would not have covered the whole distance by air. Knowing something of Commander Saccadura and Captain Gago one believes that they did in fact accomplish the full journey.

Not only do these two gallant officers deserve the greatest praise for their skill and perseverance, but the Portuguese Navy deserves congratulations on having backed an effort worthy of the great Portuguese navigators of the past. The Fairey Aviation Co. and the Rolls-Royce Co. must certainly feel gratified at their share in such a splendid sporting effort.

### THE CHANNEL ACCIDENT.

In the morning of June 3rd, Spad biplane F-MACH, which had left Croydon for Paris, fell into the Channel off Folkestone. The pilot, M. Morin, and his two passengers, Dr. Gordon Ley and M. Paul Carroll, were killed. The bodies of Dr. Ley and M. Morin were recovered from the sea by the

motor boat *Skylark*. M. Carroll's body had not been found up to the time of going to press.

The cause of the accident is unknown. Eyewitnesses say that the machine nose-dived into the sea. The fact that the bodies of the passengers were mutilated and that the machine was a complete wreck prove that it fell into the sea and did not merely turn over as the result of a bad alighting.

One gathers that the engine was a Hispano-Suiza, and not the more familiar Salmonson. Such a fall might be caused either by the breaking of an elevator control or by the pilot becoming unconscious, but hardly by engine failure. The first cause can only be prevented by careful inspection before starting, such as all British machines have to undergo, though one is not sure that French machines are subject to similar regulations. The second cause can only be prevented by using machines with dual controls and carrying a mechanic or wireless operator who, if not an expert pilot, is at any rate capable of flying and landing an aeroplane safely.

No amount of medical inspection of pilots will prevent seizures in the air, and it is impossible to fit aeroplanes with a mechanical "dead man's hand," such as is used on trams and electric trains. It is in fact rather surprising that some similar form of automatic brake is not obligatory on motor-omnibuses as well as on trams.

When our new air laws were introduced there was much outcry in this country against their severity, and it was said that they would hinder civil aviation. A clever Frenchman remarked at the time that on the contrary they would result in our air lines acquiring the trade of the world because all foreign people would believe that our lines were the most reliable because of the rigorous examination of pilots and aeroplanes, just as to-day a foreigner will pay more to ship his goods on a British vessel because of the severity of Lloyd's.

Some day, no doubt, a calamity will befall a British air liner, especially if we continue to use machines with high landing speeds and without adequate apparatus for saving life at sea, and if we persist in running without adequate wireless control from the ground. But in the meantime, it is strictly true that, thanks chiefly to the A.I.D. and the R.A.F. Medical Service, British aeroplanes do more work with fewer accidents than any others in the world.—C. G. G.

### THE WHITSUN RACE MEETING.

The Royal Aero Club's third attempt to run a race meeting at Croydon was blessed with perfect weather, excellent racing, splendid exhibitions of skilful piloting, freedom from mishaps: in fact everything necessary to a thoroughly successful meeting except a "gate." Quite the brightest remark of the day was made on this subject by a Sergeant-Major of the R.A.F., who together with a number of sporting airmen from Kenley had come over to give a hand with the machines.

One of the daily papers had established in the public enclosure a bellphone of some sort which made day hideous by playing gramophone records with the volume of a brass band, something on the lines of that instrument of torture invented by the late Horace Short and known officially as the "Parsons Auctophone," worked by compressed air. This instrument alternated fox-trots and two-steps and "howlings of Caruso" (*vide Les Silences de Colonel Bramble*) with enquiries in a nasally cavernous voice as to "What are the commonest accidents of the home?" followed by a dissertation on insuring oneself against household's knee and cock-tail elbow—or something of that sort—by filling in coupons and so forth.

While we were waiting at the far end of the ground for the first race to start and being held attendant the arrival of an air-liner which had left Paris about three hours earlier the strains of the bellphone were wafted to us intermittently on the breeze. By the way of making conversation one remarked to the Serjt.-Major, "What is that noise from the other side? Is there a dog-fight on?" to which he replied solemnly—"I don't think so, sir! If it was a dog-fight there would be more people."

As a matter of fact more people did arrive later. At any rate there were enough to make quite a respectable dog-fight gate. But certainly the attendance was poor. Whether it was because so many people had gone out of Town for the week-end; or whether the weather of the two previous meetings had created a dislike of Croydon; or whether the long waits at the earlier attempts had bored people, the fact remains that people were not there. The Committee's belief that they would get a bigger ss. gate by avoiding clashing with the Brooklands Meeting on Bank Holiday was certainly not justified and they missed the 2s. 6d. and 1s. gate which they certainly would have got on Bank Holiday.

In any case it now seems that no more meetings are to be held at Croydon, and it is said that the Aerial Derby

is to be flown from Hendon after the ground has been put in order for the R.A.F. Pagant. But what one would like best to see is a combined motor and air race meeting run at Brooklands by the B.A.C.C. and R.A.C.C., car and aeroplane races alternating. Colonel Lindsey Lloyd is the ideal Clerk of the Course, and runs a meeting better than anybody in this country for he is no respecter of persons. There are plenty of empty sheds at Brooklands to house competing machines and there are proper arrangements for everything, so why not try it one Saturday afternoon? After all the journey from Croydon or Stag Lane to Brooklands will not use any more petrol than would a test flight or a joy-ride.

#### THE FLYING.

As to the Meeting itself there was but little to say for it was without incidents. As usual the Aircraft Disposal Company, Ltd., via Major Grant and pace Colonel Darby, provided most of the competitors. Colonel Frank McLean had put up Mr. Bert Hinkler on an Avro "Viper" and was much disappointed on arriving at Croydon to find Mr. Hinkler without a machine, owing to some difference of opinion between the Avro people and the insurance people.

That inveterate veteran, Major Henry Petre, flew a Club Avro excellently but without luck. Mr. Herbert James, emotioned the crowd with the speed of the "Bamel"—very sportingly sent up to Town for the occasion by the Gloucestershire Aviation Co., Ltd. To those who know enough his slow flying and his sharp turns and his landing were even more remarkable. In fact several knowledgeable people suggested that with a little alteration it could be made into a fighting machine which would be better than anything in the world.

Mr. E. P. Raynham appeared on a Sopwith "Antelope" and showed that a brace of "dog-outs" could still fly as well as the best.

Mr. Cobham dropped in casually between "World Tours" to win a few prizes on a D.H.9 (Siddleley "Puma") taxi, "straight off the rank," as he said. He was not received or peeped on his next great venture with bands and deputations of the cinematograph trade, although he does not take a week to fly to Marseilles.

Colonel Spenser Grey flew an Avro into second place in the first race and showed that he is still as skilful in the air as in the pre-war days when he made rather a speciality of landing without killing himself under circumstances which



would have sent other people in a mangled mass to the mortuary.

Mr. Stocken disported himself on a Disposals Co. D.H.9a fitted unusually with a Rolls-Royce. It is not as fast as the famous machine which broadcasted the Morane and itself at Le Bourget, which is natural seeing that it has too h.p. less, but its movement through the air is distinctly perceptible. Incidentally one gathers that this is likely to be a standard type modification as foreign customers insist on the Rolls-Royce, which has a reputation as an aero engine abroad precisely analogous to that of the Rolls-Royce car. The Liberty which was the standard engine for the 9a is not regarded with favour.

Mr. Uwins flew the fascinating little Bristol monoplane with the "Lucifer" engine as skilfully as ever "and then some" —as the Americans say. After one race he gave a little exhibition of *adresse* which would have enthused the multitude if he had done it at Le Bourget a week or so ago. It always seems to one that this machine ought to make a first-class training machine at an R.A.F. fighting school.

Mr. Hayns flew well on an S.E.5a, entered by the Disposals Co., and managed to lose a first prize by 2/5 of a second. Major Foot flew some well-judged races on a Martinsyde, also entered by the Disposals Co., and managed to win a third place without a prize. Mr. Alliott, an R.A.F. officer, squeezed a Club Avro, previously flown by Major Petre, into second place in the last race by sheer good course-keeping.

Altogether it was quite an entertaining show and two of the finishes were remarkably close, in spite of the handicapping by performance, instead of by judgment. The results were as follows:—

EVENT I.—1, Cobham (D.H.9 Siddeley "Puma"), scratch, time 16 mins. 30 secs.; 2, Spenser Grey (Avro), h'cap. 4 mins. 20 secs.—16 mins. 30.1/5 secs.; 3, Raynham ("Antelope"), h'cap. 1 min. 15 secs.—16 mins. 59 secs.

EVENT II.—1, Cobham (D.H.9a "Puma"), h'cap. 1 min. 15 secs.—7 mins. 13.4/5 secs.; 2, Hayns (S.E.5a), h'cap. 33 secs.—7 mins. 14.1/5 secs.; 3, Stocken (D.H.9a Rolls-Royce), h'cap. 26 secs.—7 mins. 54 secs.

EVENT III.—1, Uwins (Bristol Monoplane "Lucifer"), h'cap. 3 mins. 4 secs.—18 mins. 14 secs.; 2, Raynham ("Antelope"), h'cap. 1 min. 45 secs.—18 mins. 20.2/5 secs.; 3, Foot (Martinsyde), h'cap. 17 secs.—19 mins. 17 secs.

EVENT IV.—1, Raynham ("Antelope"), h'cap. 2 mins.

24 secs.—16 mins. 11 secs.; 2, Alliott (Avro), h'cap. 6 mins. 4 secs.—16 mins. 4 secs.; 3, Stocken (D.H.9a Rolls-Royce), h'cap. 39 secs.—16 mins. 32 secs.

### FLYING IN AN AIR RACE.

Possibly flying in an air race is the most exciting form of peace time flying obtainable, especially if one adds to it a certain financial interest by patronage of "Long Tom."

On Saturday afternoon Captain Stocken took one as passenger in the Aircraft Disposal Company's D.H.9a (Rolls-Royce). We gave a start to the two Avros, the Antelope of Mr. Raynham, the D.H.9b of Mr. Cobham, and the Bristol monoplane, and started off a few seconds ahead of Major Foot's "Tinsyde" and Mr. Hayns' S.E.5a.

The first excitement was the turning of Beddington chimney, which Captain Stocken took with a clean vertical turn about fifty feet from the ground. It is safe to say that on no turn whatever did he lose any ground whatever. Coming down the acrodrome leg of the course passing the I - told - you - they - would - be - sparsely - populated - enclosures - if - you - held - the - races - on - Saturday - and - not - on - Bank - Holidays - we were rapidly overhauling Mr. Cobham and also the Avros and Mr. Raynham, while Major Foot and Mr. Hayns were keeping a respectful distance.

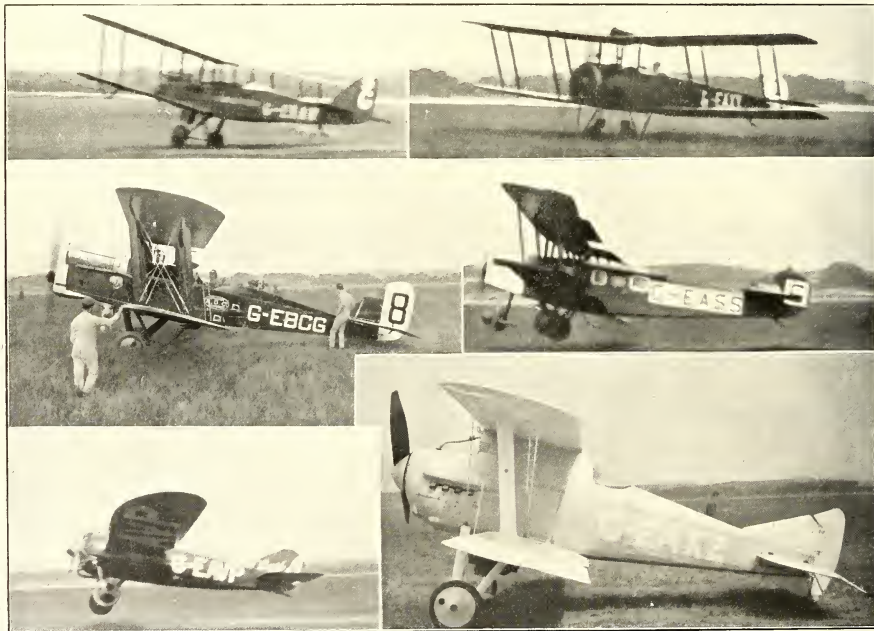
Another turn over the white cross on Purley golf course and back we came across the valley and just above the tree-tops to the chimney for another vertical turn, Captain Stocken the while shrieking invectives to keep one's head, the office where one was much already. One retaliated in the approved manner by wild cries of "Come on, Steve"! which the aerial Donoghue proceeded to do.

At the second turning of the white cross we passed the monoplane and were right on Mr. Cobham's tail, and Major Foot was right on ours.

We overhauled Mr. Cobham just before turning the chimney, which was passed a few seconds later with the 9b and the Tinsyde a few feet below turning at the same time and the S.E.5a a second or so behind.

Here we had the advantage of height, being now at above 100 feet. So we led Major Foot down the straight and just passed one Avro and would have caught the second Avro and the Antelope in another half-minute.

It was a great race and Captain Stocken flew a faultless course.—G. D.



FLYING AT CROYDON:—Left to Right—Top, Mr. Cobham getting off and Lieut.-Col. Spenser Grey just lifting out of the long grass. Middle, Capt. Stocken at anchor and Mr. Raynham getting off. Bottom, Mr. Uwins getting off and the "Bamel" at rest.





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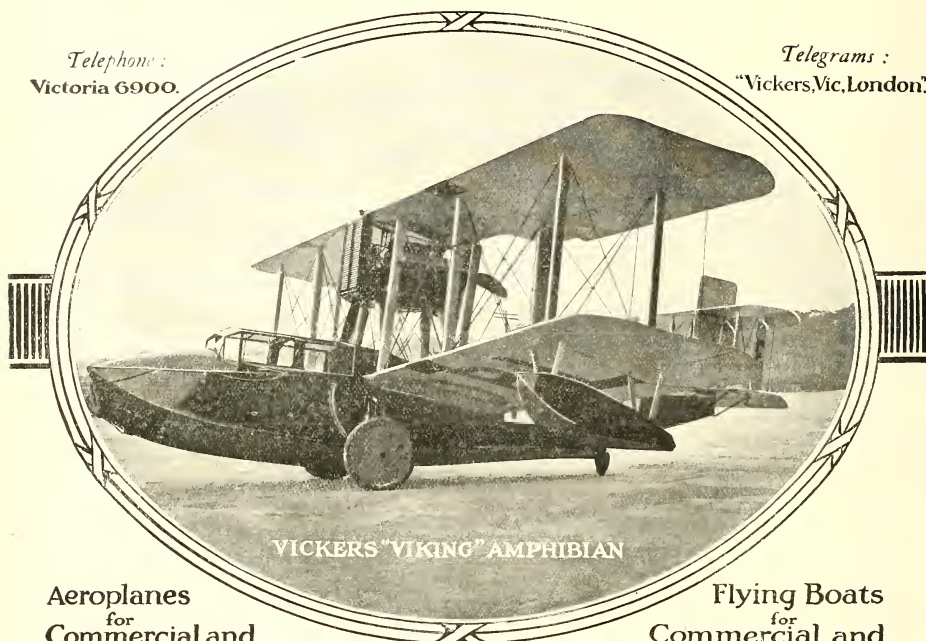
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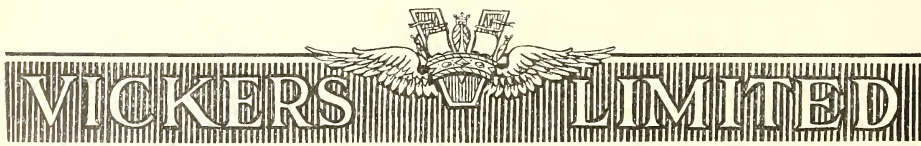
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# AERONAUTICAL ENGINEERING

## SUPPLEMENT TO "THE AEROPLANE"

INCORPORATING AIRCRAFT ENGINEERING AERODYNAMICS, AIRCRAFT FINANCE AND COMMERCIAL AERONAUTICS AND MATTERS PERTAINING TO THE AERONAUTICAL ENGINEER AND THE AIRCRAFT TRADER.

### THE WEEKLY COMMENTARY.

The paper on the "Seaplane's Place in Aviation," read before the Institution of Aeronautical Engineers by Major D. C. M. Hume on May 25th, is reported in abstract below.

It will be found that both the paper and the discussion disclose once more how very great a field of utility there is for the seaplane, and how undeserved is the neglect into which this type of aircraft has fallen. There are innumerable fields throughout the world, a good many of them within the British Empire, where the seaplane, and no other type of vehicle, can provide rapid and reasonably cheap transport.

Yet "commercial" aviation still struggles against the most severe handicaps in an effort to compete with first class railroad systems.

Some very interesting photographs taken at Göttingen by Herr Lachmann show the nature of the air flow past a slotted aerofoil model. The facts disclosed in the tests that burbling occurs first in the centre of a wing, and does not occur at the wing tips until a very great angle of incidence, is of some considerable importance.

Among other items of interest in this issue will be found excellent photographs of the new Vickers "Vulcan" passenger-carrying machine, and of the engine, derived from the well-known "Manitou" aero engine, which has recently made such astounding speeds in a Sunbeam motor car at Brooklands.

### THE SEAPLANE'S PLACE IN AVIATION.

On Thursday, May 25th, Major D. C. M. Hume read a paper before the Institution of Aeronautical Engineers under the above title.

Major Hume said that the seaplane seemed at present to be "nobody's child" in this country. It had suffered from ignorance, not in the usual sense of lack of knowledge, but in the truer sense. It had in fact been ignored. The seaplane offered problems of design more complicated than those of the land machine. The late war had forced the development of the simpler type to a useful stage long before the seaplane had reached anything like equal development, and consequently relatively few people were aware of the seaplane at all.

#### THE SEAPLANE IN WAR.

Aviation fell under two heads—War and Commerce. The position of the seaplane was different in the two cases. Taking War first the idea of carrying on operations over the sea in any machine incapable of safely alighting on the sea seemed illogical and close to the culpable. The counter argument usually met is to grant the objection and to ask "Can you do the same job with the seaplane?" The answer is "Yes, with the probable exception of high performance fighting."

Bombing and spotting for submarines, fleet reconnaissance, long range patrols, blockade and torpedo work can all be done by seaplanes. They cannot be done so easily—from the designer's point of view—and they call for a good deal of double-handed knowledge and some special ingenuity.

Seaplanes can be built with very comparably the same structure weight percentage as land machines. They can safely be made to land faster, which means higher wing loading and consequently high useful load percentage—probably at the expense of "ceiling." In general, "ceiling" is less important in seaplanes than in land machines, although Major Hume inclines to the belief that the next war will demand the pushing up of ceiling by super-chargers, flap gears and other gadgets. Certainly "ceiling" will be important for bombing battleships, if that form of amusement is continued, but the lecturer believes that as the object of attack is to let water into the battleship, the torpedo is the right weapon to use. The float seaplane is suitable for self-defended reconnaissance, and for torpedo carrying. It is only fair for work from carrier ships, owing to poor view, and it is indifferent for fighting owing to distributed loads, and consequently poor manoeuvrability.

#### LAND MACHINES FOR FIGHTING.

Fighting of the present type is best done by land machines operating from a carrier. They are cheap, small and "nippy." The wastage—as a percentage—will be high, but reckoned in net expenditure it will be small.

The flying boat is suitable for long range work, and all general reconnaissance, bombing and spotting work. It is the right tool to use against submarines. In small sizes it is good for deck landing if made amphibian. Being a searworthy affair it can survive in difficulties and may remain away from its base on occasion. It is a bad fighter, being prone to blind spots and is often slow to manoeuvre.

It lends itself to development in large sizes, to an extent unapproached by any other aircraft save the airship. The air fleet of the future will require to carry large loads. Large loads mean long runs to get off, and call for safe landing spaces. That there is twice as much water on the earth as there is land, carries some way in the argument. Seaplanes can be loaded to 11½ lbs. per square foot and to 20 lbs. per h.p. and get off. The North Sea patrols during the war were carried out on loadings of 15 lb. per h.p. on machines evolved rather than designed, and when at the end of the war the flat went forth, "Let there be a seaplane built in the light of the accumulated experience," the result was a machine 20 feet less in span, 1,000 lbs. lighter and 10 knots faster.

#### SEAPLANES FOR COMMERCE.

The seaplane in commerce has to meet a totally different set of conditions. The carriage of the maximum of load at maximum efficiency is needed. Height is of secondary importance. Insurable losses must be rendered exceptional, reliability and punctuality must be studied. For these conditions the large boat seaplane is indicated. Such a machine can carry a very large weight. It is so much faster than any surface ship that the speed bogey may be greatly discounted, and consequently a large paying load is possible.

The lecturer mentioned, as the sort of machine he had in mind, a twin-engined boat—value, say £13,000—loaded to 20 lbs. per h.p.; the paying load, with 6½ hours' fuel at full power (60 knots speed), would be 33½ per cent. With half the fuel giving a range of 350 sea miles, the paying load would be 41 per cent. or 8.2 lbs. per h.p. With 11½ lbs. per sq. ft. the landing speed would be about 54 knots. These figures are approximate and are based on an existing machine, and a specially built machine could probably be built to give better figures. The flying boat can even now be built of such a size that it can carry not only finicking valuables, luxuries, and notoriety-seeking nobodies, but real cargoes of perishables, urgent ponderables, and things that are wanted in a hurry. But the commercial possibilities of the seaplane have been left untried.

#### A FUTILE EXPERIMENT.

Commercial aviation has apparently been bent on proving itself on the world's worst route, from the hardest country in which to do consistent flying. A laudable



idea and a creditable experiment, but not necessary as the propaganda value which it deserves. While it takes as long to reach and to drive away from the terminal aerodromes as it does to do the actual flying, the fly in the ointment is apt to obtrude. [Should this not be the reverse of fly?—Ed.]. Perhaps before long the seaplane will remove that actually small but psychologically large deterrent from before the prospective passenger.

To the Post Office the seaplane can be of great service. Outlying parts of the Empire can be mailed quickly and more frequently. Express work can be carried on where hitherto impossible. In the case of Canadian mails, land is sighted two days before the liner is berthed. In half that time mails could be collected and distributed to Quebec, Montreal, Toronto, and Ottawa.

The commercial seaplane has one great business advantage; it need not run as a competitor with existing transport services—but rather as a super-service in connection.

The seaplane, however, requires somewhat specialised personnel, particularly in the matter of pilots.

The seaplane started in France, continued in England, advanced in America, and was perfected again in England. England can build the best seaplanes in the world, and it is up to us to use it to the best advantage as our natural characteristics and the unique opportunities afforded by our geographical distribution permit.

#### THE DISCUSSION.

Capt. GOODMAN CROUCH expressed by letter his inability to be present. He agreed with the lecturer that given reliability and seaworthiness the seaplane would take an important part in the future development of aviation.

Dr. A. P. THURSTON confessed his ignorance of seaplanes. The author's arguments in favour of that type were of a convincing nature. There were in various parts of the world vast waterways through territories where the ground conditions forbade the use of land machines, and the seaplane alone could afford rapid transit in these territories. He instanced the vast basin of the Amazon, where even if one cleared aerodromes the ground would be jungle again in a month or two, but which was entirely navigable by seaplanes. The wealth of this district has scarcely yet been scratched, and the seaplane would make its exploitation possible.

The one disadvantage of a seaplane had not been mentioned. What about landing in open sea in a real gale? No existing machine could stand it, and this was a serious difficulty which would have to be got over.

The mention of seaplanes and of tropical districts suggested to him a possible use for seaplanes. The tropics were the home of soaring birds, and it was only a question of time before man discovered how to soar. He thought small seaplanes, with just enough engine power to get off, would be useful exploratory tools.

There was another drawback to seaplanes. The necessary floats were always disturbers of control and stability which prevented their being thrown about with facility. He thought this serious, as it made it difficult to get out of tight corners, and so reduced safety.

Capt. SAYERS thought the Institution was to be congratulated on having had two excellent papers devoted to seaplanes. The seaplane had suffered from an unwarranted neglect which was largely due to the curious conditions of the late war, wherein the greatest of sea Powers had fought an almost purely land campaign. He did not propose to discuss the seaplane for war purposes, for he had a considerable experience of seaplanes during the late war, and he was certain that the next war would be of as little value as had been our pre-war experience in the case of the last war. But he did want to emphasise the very great commercial possibilities of the seaplane.

Over sea, one had as a maximum to compete with 25 knot ships. One could use unlimited landing and getting-off spaces. There were no hills to fly into at sea, and with the aid of night-landing devices of a mechanical nature, plus proper wireless direction finding, neither fog nor night flying presented serious difficulties.

The coasts of the world were littered with busy seaports which had no more rapid inter-communications than 10 knot ships. These ports provided ready-made the terminal facilities which cost so much on land routes, and those facilities were at the ports and not an hour's journey from them. Low cruising speeds were permissible—for instance, on the London-Paris route the average speed from London to Paris on a 110 knot machine was about 60 knots, and an 80 knot seaplane would give faster transit. This drop in speed, combined with the larger space available for getting off and landing, would allow of a more economical machine, despite the handicap of floats or hull.

Dr. Thurston had mentioned tropical riverways. It was interesting to observe that Belgium, which had no aircraft manufacturers, had already instituted a 1,000 mile route on the Congo which saved weeks on the journey up that river,

and it was amazing that Britain, with its Colonies and its aircraft industry, had done nothing whatever in this direction.

Mr. W. O. MANNING said that the seaplane was the only machine for over-water work. Personally he had always thought that land machines should be prohibited from flying over any ditch they could not glide across. It was not generally realised that the seaplane was really extraordinarily safe. The casualties on seaplanes—due to crash and not to war risks—during the war had been practically nil. He thought there was only one case of a really bad smash on a seaplane. Personally he would rather fly overland on a seaplane than fly to Paris on a land machine.

#### THE REPLY.

Major HUME, in reply, said the discussion had been very interesting. He was glad that Dr. Thurston had raised the question of tropical waterways. He would like to instance the case of Canada, where aerial photographs demonstrated that much of the largest land, absolutely impracticable for land machines, was quite suitable for seaplanes. In that country survey work in seaplanes was being of the greatest value—work could be done in a day or two which otherwise required months.

In one case a survey was completed in six weeks which otherwise would have taken six years. A forest patrol official has discovered in his own district a large lake of which he had never even heard as the result of a flight over it, and in another case, a seaplane and its crew carried out in one day work which would have required an outfit of nearly 30 men and have taken some weeks to complete.

With regard to the rough sea difficulty, the question was one of relative sea purely. Each floating craft had a definite relative sea in which it could not live. This sea was a question of design and size of hull. There seemed no reason why the size of seaplanes should not go on increasing—and with it the seaworthiness. But he would point out that landing in open sea was for peaceful work at any rate, an emergency landing. That such an emergency landing might be dangerous was no more against the seaplane than was the fact that an emergency landing in bad country was dangerous to any machine. On the whole he was satisfied that seaplanes were safer than land machines.

As to the suggestion to use seaplanes to investigate soaring, he thought this was scarcely a practical proposition. He was very interested in soaring flight, but it was necessary to restrain one's enthusiasm and it was not always safe to copy Nature. Nature for instance never used the wheels—think of motor-car copied from Nature. As to using seaplanes with just enough power to get off, the trouble was that that was all the power the seaplane needed.

He did not agree with the hankering after throwing a seaplane about. The seaplane was not the right type for work in which that was necessary. For peaceful work—owing to the large landing spaces possible—there should be no need for it, so why do it?

He was glad Captain Sayers had mentioned the mechanical landing device. It was going to be very useful in the future, for fog was the only danger to the seaplane pilot and the landing device would overcome this danger to a very great extent.

He thought Mr. Manning had fallen into the very usual trap of considering the London-Paris route as a fair example of an air route. It was a thoroughly bad route—even for seaplanes—because of the overcrowded condition of the Thames and Seine.

As to safety he agreed with Mr. Manning. During the war, the North Sea Patrol did an enormous amount of work. There were casualties, but most of them were due to the exuberance of pilots. In one case a small seaplane and a large boat indulged in a mock fight.

The seaplane collided with the boat when coming down, and punched a large hole in the bottom of the boat. The seaplane pilot was killed, but the boat landed, and by keeping at a high speed on the water got safely ashore. Such a collision on land machines would almost certainly have led to serious results to both parties.

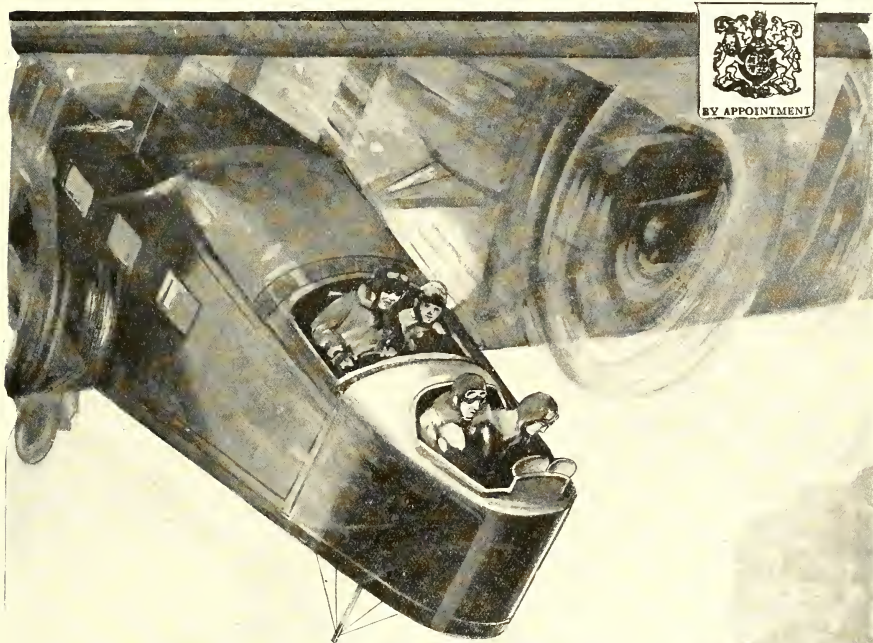
#### ANOTHER GERMAN SOARING PRIZE.

In addition to the contests for soaring flight described in THE AEROPLANE of May 24th, a further contest is now announced. This takes the form of a contest for a cup, to be known as the "Kolzenberg-Hochschule-Wanderpreis für Segelflug." The contest is to be open annually until 1926. The cup will be awarded each year to the entrant who during that year shall make the soaring flight of maximum duration which shows a rate of descent of not more than 0.4 metres per second.

The competitor who gains the cup in three successive years will be awarded the cup definitely, but it will remain not in his possession, but in that of the Technical High School of which he is a student.

Both competitor and pilot must be German students at a German University.

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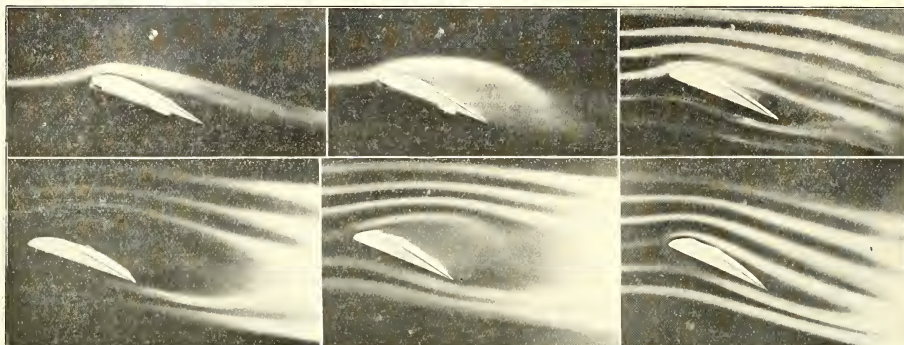
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## THE FLOW ROUND A SLOTTED WING.



The accompanying photographs, which were taken by Dipl. Ing. Lachmann, at the Göttingen laboratory, show the air flow round a model of a wing fitted with slots of the type developed in this country by Mr. Handley Page, and in Germany by Herr Lachmann.

The flow is shown by admitting to the general current past the model in the tunnel a series of jets of the white "smoke" produced when hydrochloric acid gas is mixed with ammonia vapour. The model used is one of fairly thick section, fitted with a leading edge slot over the centre two-thirds of the span. The wing tips of the model are solid.

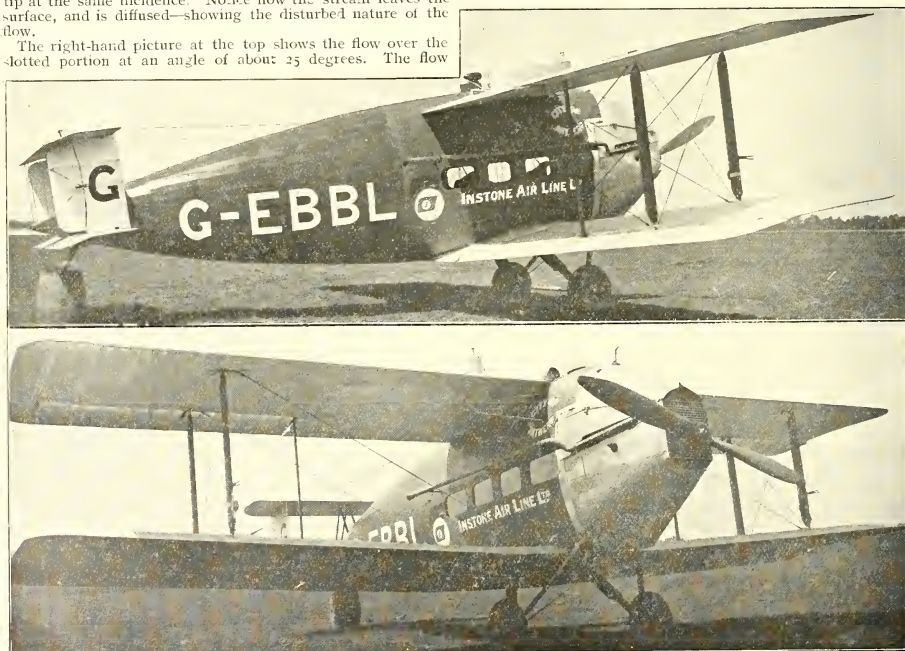
The "smoke" jet apparatus could be so adjusted that the smoke passed over either the central slotted portion or over the unslotted tips.

The left-hand photograph in the top row shows the flow over the slotted portion of the wing at an angle of incidence of 27 degrees. It will be seen that the smoke stream follows closely the upper surface and does not spread unduly. The next picture in the top row shows the flow over the unslotted tip at the same incidence. Notice how the stream leaves the surface, and is diffused—showing the disturbed nature of the flow.

The right-hand picture at the top shows the flow over the slotted portion at an angle of about 25 degrees. The flow

follows the general run of the section smoothly. The left-hand photograph in the bottom row shows the flow over the unslotted end at the same incidence. The streams above the model are just visible, they depart upwards from the surface, and behind the model they spread, showing turbulence. In the tests it was only found possible to produce turbulent or burbling flow in the centre of the wing at very low velocities, and at the tips it could be produced only at very big angles. From this it is deduced that burbling occurs first at the centre of the wing and spreads to the tips, and secondly that it occurs earlier and earlier as the product of the size of model and the air velocity is decreased.

The second photograph in the lower row shows burbling at the slotted centre at an angle of 31 degrees, and the last photograph the relatively good air flow over the unslotted tips at a velocity of 10 metres per second and an angle of incidence of 27 degrees. When the velocity was reduced to 3 metres a second burbling occurred at the tip under these conditions.

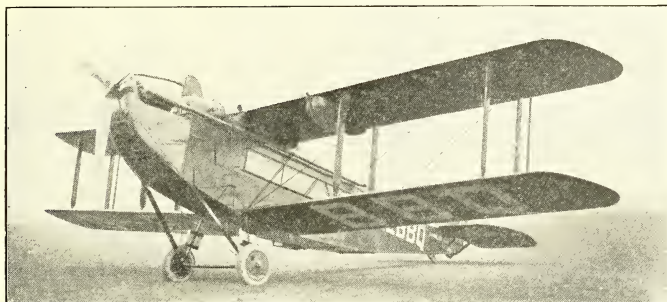


The Vickers "Vulcan" (350 h.p. Rolls Royce Engine) which is to be used by the Instone Air Line. With high lift wings this machine carries a large load at a reasonable cruising speed, lands slowly, and gets off quickly.



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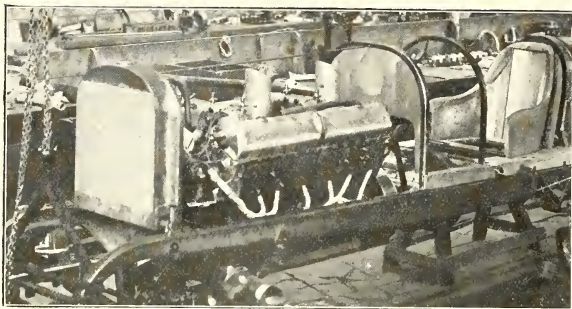
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### A MEDITERRANEAN NETWORK.

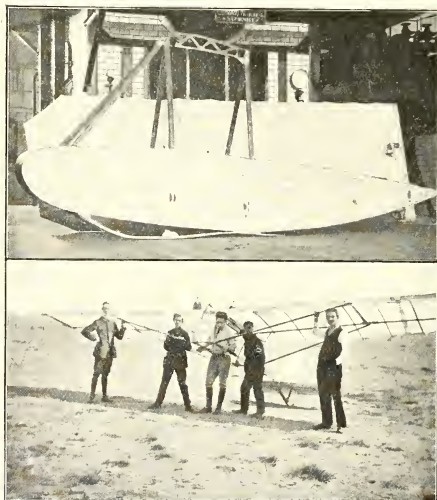
According to a correspondent of *Les Ailes* of Paris, the two great French steamship concerns—La Compagnie des Messageries Maritimes and La Compagnie Generale Transatlantique—are largely concerned in the formation of a society to be known as "La Néréide" which has as its object the exploitation of a network of aerial services operating in the basin of the Mediterranean.

No doubt in the course of time British steamship lines of the first class will wake up to the possibilities of air transport as an auxiliary to their steamship services. But it seems probable that by that time the more progressive mercantile marines of Germany and France will have forestalled them in this work.

### THE ANNUAL MEETING OF THE W. G. L.

The "Wissenschaftliche Gesellschaft für Luftfahrt" will hold its 17th annual reunion and conference at Bremen, from June 17th to 21st next. The proceedings will include papers by Dr. Ing. Rohrbach on "The Growth in Size of Aeroplanes"; by Dr. Everling on "Limits of Aeroplane Speed"; by Captain Bovkov on "Aerial Navigation in Fog"; by Dr. Wagner on "The Steam Turbine for Aeronautical Purposes"; and by Professor von Karman on "The Helicopter."

The conference will also witness the opening of the Air Port of Bremen, and will pay a visit to the famous seaplane station at Norderney.



**GLIDING AND SOARING IN GERMANY.**—The upper picture shows the training soaring machine built by the Flugtechnischer Verein, Dresden. Below is a simple glider for training and practice built by Hamburg enthusiasts.

The engine of the Sunbeam car which, driven by Mr. K. Lee Guinness, on May 17th, covered the flying half-mile at Brooklands at an average speed for two ways of the track of over 136 m.p.h., and made 96.3 m.p.h. over the same distance from a standing start.

The engine is evolved from the Sunbeam "Manitou" aero-engine of 300 h.p., which it resembles very closely except in regard to the valve gear.

It is a 12 cylinder Vee, 60 degrees between cylinders, 120 m.m. bore by 135 stroke, fitted with three overhead valves per cylinder. The cylinder blocks are of aluminium with steel liners, the pistons are of aluminium, and the engine is lubricated on the drysump system, so that it may be regarded as essentially of aero-engine type.

### THE PIEMONTE PRIZE.

Under the patronage of the Federazione Aeronautica Nazionale Italiana (F.A.N.I.) and the initiative of other aeronautical associations, an international competition for commercial aircraft will be held during the last week of June, 1922. The course is to be three times the circuit bounded by the cities of Turin—Cuneo—Alexandria—Novara—Biella—Turin, a distance of approximately 683 miles. Competitors will be permitted to land twice besides at the place of starting and arrival, for refuelling, etc.

The classification will be settled by the following formula:

$$K = \frac{V_c}{V_{min}} \frac{P}{Q}$$

Where Q equals the commercial load of the machine in kilograms; P the weight in kilograms of petrol consumed;  $V_c$  the commercial speed in km.p.h. taken to cover the course, and  $V_{min}$  the minimum flying speed in km.p.h. of the machine. In any case  $V_c$  must not be less than 120 km.p.h. and the commercial load must not be less than 300 kilograms, excluding the weight of the pilot, which is considered as 80 kilograms, for everybody.

So far, it is known that a prize of (It.) £40,000 will be awarded to the constructors, and (It.) £10,000 to the pilot of the winning machine.

### DORNIER IN LEGHORN.

It has been mentioned in the Italian Press that the Dornier firm is about to be transferred to Leghorn and will occupy the works that have up to now belonged to the firm Gallivari, which, it is rumoured, has been dissolved.—A. B.

### NEW COMPANIES.

**AIRCO AERIALS LTD.**—Private Company. Registered May 18th. Capital £2,000 in £1 shares. To carry on the business of manufacturers of and dealers in photographic materials and apparatus, photographs, pictures, prints and other works of art, aerial, commercial and general photographers, manufacturers of aeroplanes or parts thereof, etc. in England, U.S.A. and elsewhere. The first directors are:—Capt. S. W. Hiscocks, Grove Park House, Kingsbury, Middlesex (permanent); H. A. Peters, "Holmesley," 74, Finchley Lane, Hendon, N.W.

Qualification: £1. Secretary S. W. Hiscocks. Registered office, 15, Fumival Street, E.C.4.

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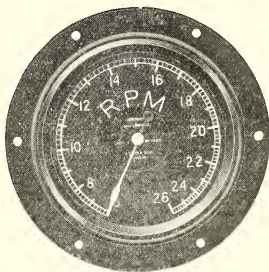


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#### CONTINENTAL ARRIVALS AND DEPARTURES.

[The following table of arrivals at and departures from the British Air Ports is compiled on the following system:—First come the initials of the Air Line; next the type of machine; next the international number of the machine; next the ports of departure and destination; next the times of departure and arrival; next the cargo, whether goods (G) and/or mails (M); next the number of passengers; and finally the name of the pilot and number of mechanics, if any.]

#### The London Terminal Aerodrome, Croydon. (Telephone: Croydon 2720.)

##### MAY 29th:

I.L., DH134, G-EBBT, London-Paris, 05.17-08.00, G., 1, Holmes.  
M.A., Brequet, F-CMAB, London-Paris, 05.20-08.25, G., Nil, Briere.  
D.A., DH34, G-EBBS, London-Paris, 08.29-10.55, M., 1, Robertson.  
K.L., Fokker, H-NABN, London-Adm, 10.22-12.07, G. & M., Nil, Pyl.  
I.L., DH134, G-EBBR, London-Paris, 11.41-14.13, G. & M., 3, Robins.  
H.P., DH18, G-EAWX, London-Paris, 12.24-15.05, G. & M., 4, Carter.  
M.A., Goliath, F-ADCA, London-Paris, 13.10-16.15, G., Nil, Le Sac & 1.  
I.L., DH18, G-EAWW, London-Brussels, 13.16-16.24, G. & M., Nil, Brady.  
G.E., Goliath, F-ADDT, London-Paris, 13.57-16.30, G., Nil, Favrac.  
K.L., Fokker, H-NABT, Ldn-Adm, 14.28-16.16, G. & M., Nil, Silhms.  
D.A., DH34, G-EBBS, Ldn-Adm, 14.55-17.15, G. & M., Nil, Hinchiffe & 1.  
I.L., Westland, G-EARF, London-Paris, 16.26-18.55, G. & M., 1, Powell.  
M.A., Brequet, F-CMAL, London-Paris, 17.06-19.40, G., 2, Donchin.  
M.A., Brequet, F-CMAL, Paris-London, 18.05-20.50, G. & M., Nil, Donchin.  
D.A., DH34, G-EBBS, Paris-London, 14.33-15.39, Nil, 4, Robertson & 1.  
G.E., Goliath, F-ADDS, Paris-London, 12.35-15.43, G., 10, Labouchere & 1.  
I.L., Westland, G-EAUF, Paris-London, 14.33-15.43, Nil, 3, Courtney.  
K.L., Fokker, H-NABT, R'dm-Ldn, 11.29-14.28, G. & M., Hofstra.  
M.A., Goliath, F-ADAY, Paris-London, 14.16-16.22, G. & M., 4, Le Men & 1.  
K.L., Fokker, H-NABT, R'dm-Ldn, 14.47-16.38, G. & M., 4, Geyssendorfer.  
M.A., Spad, F-ACMB, Paris-London, 16.40-19.10, G. & M., Nil, Barnard.  
D.H., DH9, G-EBEC, Paris-London, 16.53-19.17, Nil, 2, Wilson.  
I.L., DH134, G-EBBR, Paris-London, 16.54-19.14, Nil, 2, Robins.  
G.E., DH134, G-EAUF, Paris-London, 17.19-19.55, Nil, 2, Olly.  
D.A., DH34, G-EBBS, Paris-London, 19.28-21.35, Nil, 4, Herne & 1.  
H.P., HP, G-EATH, Paris-London, 12.22-15.03, G., 2, Rogers & 1.

##### MAY 30th:

M.A., Spad, F-ADBI, London-Paris, 05.15-08.15, G., 1, Raue.  
D.A., DH34, G-EBBS, London-Paris, 08.37-10.45, G. & M., Nil, Herne & 1.  
K.L., Fokker, H-NABS, Ldn-Adm, 10.06-12.30, G. & M., 1, Geyssendorfer.  
H.P., WS, G-EBBB, London-Paris, 10.24-12.55, G. & M., 5, McIntosh & 1.  
I.L., DH134, G-EBBR, London-Paris, 11.37-13.59, G. & M., 3, Shepperson.  
M.A., Goliath, F-ADAY, London-Paris, 13.12-16.10, G., 1, Le Men & 1.  
K.L., Fokker, H-NABT, London-Adm, 14.11-17.25, G. & M., 3, Hofstra.  
G.E., Goliath, F-ADDS, London-Paris, 14.15-17.14, G., 4, Labouchere & 1.  
D.A., DH34, G-EBBS, London-Paris, 14.25-16.30, Nil, 2, Hinchiffe & 1.  
M.A., Brequet, F-CMAL, Paris-London, 05.23-07.40, G. & M., Nil, Delage.  
K.L., Fokker, H-NABT, Adm-London, 10.08-12.31, G. & M., Nil, Varnar.  
D.A., DH34, G-EBBS, Paris-London, 11.33-13.39, Nil, Hinchiffe.  
I.L., DH134, G-EBBT, Paris-London, 11.50-14.14, Nil, 4, Holmes.  
I.L., Westland, G-EARF, Paris-London, 11.53-14.50, G., 3, Powell.  
K.L., Fokker, H-NABT, R'dm-Ldn, 14.52-17.22, G. & M., 1, Van der Hoop.  
I.L., DH134, G-EBBR, Paris-London, 16.40-19.45, G., 6, Shepperson.  
D.A., DH34, G-EBBS, Paris-London, 18.30-20.45, Nil, 3, Herne & 1.  
H.P., DH9, G-EAWX, Paris-London, 12.20-15.03, G. & M., 4, Carter.  
M.A., Goliath, F-YHMF, Paris-London, 11.40-12.53, G., 6, Grasset & 1.  
G.E., Goliath, F-GEAO, Paris-London, 13.35-15.05, G., Nil, Grasset & 1.

##### MAY 31st:

M.A., Brequet, F-CMAL, London-Paris, 05.10-07.53, G., Nil, Delage.  
I.L., DH134, G-EBBT, London-Paris, 05.14-07.52, G. & M., Nil, Jones.  
D.A., DH34, G-EBBS, London-Paris, 08.35-10.45, M., Nil, Robertson.  
K.L., Fokker, H-NABO, London-Adm, 10.09-12.21, G. & M., Nil, Varnar.  
H.P., DH18, G-EAWX, London-Paris, 12.27-15.04, G. & M., Nil, Orlitz.  
I.L., DH134, G-EBBR, London-Paris, 12.45-15.12, M., 6, Holmes.  
M.A., Goliath, F-YHMF, London-Paris, 13.21-16.45, G. & M., Catta & 1.  
P., Nieuport, N54, London-Paris, 13.49-15.22, Nil, Nil, Pissard.  
K.L., Fokker, H-NABM, Ldn-Adm, 14.10-16.50, G. & M., Nil, Van der Hoop.  
I.L., Westland, G-EARF, Ldn-Brussels, 14.23-16.49, G. & M., Nil, Courtney.  
G.E., Goliath, F-GEAO, London-Paris, 14.29-17.25, G., 1, Grasset & 1.  
D.A., DH34, G-EBBS, Ldn-Paris, 14.43-16.50, Nil, 2, Nil, Hinchiffe.  
M.A., Brequet, F-CMAL, London-Paris, 17.30-20.10, Nil, 2, Portal.  
M.A., Brequet, F-CMAL, Paris-London, 05.26-08.06, G. & M., Nil, Portal.  
K.L., Fokker, H-NABN, Adm-London, 10.42-12.35, M., Nil, Pyl.  
D.A., DH34, G-EBBT, Paris-London, 11.30-13.56, G., 1, Jones.  
P., Nieuport, N54, Brussels-London, 11.32-13.16, Nil, Nil, Pissard.  
D.A., DH34, G-EBBS, Paris-London, 11.35-13.45, G., 3, Hinchiffe.

ABBREVIATIONS:—A.D.—Aircraft Disposal Co. R.A. Berkshire Aviation Co. B.C.—Bristol Aeroplane Co. C.A.—Department of Civil Aviation. D.A.—Daimler Airway. D.H.—De Havilland Aircraft Co. G.E.—Compagnie des Grands Express Aeriens. H.P.—Handley Page Transport Ltd. I.L.—Institute Air Line. K.L.—Koninklijke Luchtvaart Maatschappij. L.A.—Leatherhead Aviation Services. M.A.—Messageries Aeriennes M.W.—Marconi Wireless Telegraph Co. Ltd. P.O.—Privately owned. P.L.—Peters Ltd. S.F.—Surrey Flying Services. S.N.—Syndicat National pour l'Etude des Transports Aeriens (S.N.E.T.A.).

G.E., Goliath, F-ADDT, Paris-London, 11.36-14.18, G., 3, Rissier & 1.  
M.A., Goliath, F-ADCA, Paris-Ldn, 13.55-16.16, G. & M., 1, Charpentier & 1.  
H.P., WS, G-EBBB, Paris-London, 12.15-14.52, G., 11, McIntosh & 1.  
K.L., Fokker, H-NABT, R'dm-Ldn, 14.23-17.20, G. & M., Nil, Silhms.  
M.A., Spad, F-ACMB, Paris-London, 15.25-18.12, Nil, 1, Perignon.  
I.L., DH134, G-EBBR, Paris-London, 16.15-18.47, G., 1, Holmes.  
D.A., DH34, G-EBBS, Paris-London, 17.15-19.45, Nil, 4, Robertson.  
I.L., Westland, G-EARF, Brussels-London, 18.00-20.24, Nil, 3, Courtney.

##### JUNE 1st:

M.A., Spad, F-ACMB, London-Paris, 05.30-08.33, G., Nil, Perignon.  
I.L., DH134, G-EBBT, London-Paris, 05.32-08.03, G., Nil, Robins.  
D.A., DH34, G-EBBS, London-Paris, 08.20-10.50, M., Nil, Robertson.  
K.L., Fokker, H-NABN, London-Adm, 10.00-12.46, G. & M., 1, Pyl.  
H.P., Bristol, G-EAWY, London-Paris, 10.01-12.55, Nil, 4, Carter & 1.  
I.L., DH134, G-EBBR, London-Brussels, 11.40-14.12, G. & M., 3, Shepperson.  
H.P., WS, G-EBBB, London-Paris, 12.22-15.15, G. & M., 2, McIntosh & 1.  
M.A., Goliath, F-ADCA, London-Paris, 13.30-16.30, G., 4, Charpentier & 1.  
K.L., Fokker, H-MABD, London-Adm, 14.33-16.54, G. & M., 1, Silhms.  
G.E., Goliath, F-ADDT, London-Paris, 15.10-16.45, G., Nil, Rissier & 1.  
I.L., Vulcan, G-EBBL, London-Paris, 16.42-19.25, G. & M., 6, Barnard.  
D.A., DH34, G-EBBS, Paris-London, 17.09-19.16, Nil, 1, Shepperson.  
M.A., Brequet, F-CMAL, Paris-London, 05.25-08.02, G. & M., Nil, Briere.  
K.L., Fokker, H-NABT, Adm-London, 10.24-12.55, G. & M., 2, Hofstra.  
I.L., DH134, G-EBBR, Paris-London, 17.09-19.16, Nil, 2, Robins.  
H.P., DH18, G-EAWX, Paris-London, 12.13-14.32, G., 6, Olly.  
D.A., DH134, G-EBBS, Paris-London, 13.30-15.36, Nil, 2, Robertson.  
M.A., Goliath, F-ADAY, Paris-Ldn, 13.20-16.20, G. & M., 2, Chaboux & 1.  
G.E., Goliath, F-GEAO, Paris-Ldn, 14.25-16.54, G., Nil, Labouchere & 1.  
K.L., Fokker, H-NABS, Adm-Ldn, 14.32-16.51, G. & M., Nil, Geyssendorfer.  
H.P., Bristol, G-EAWY, Paris-London, 15.30-18.00, Nil, 2, Carter & 1.  
I.L., DH134, G-EBBR, Brussels-London, 16.42-19.25, G. & M., Nil, Shepperson.  
M.A., Spad, F-ADBI, Paris-London, 18.40-21.09, Nil, 3, Revenue.

##### JUNE 2nd:

I.L., DH134, G-EBBT, London-Paris, 05.16-07.50, G., Nil, Powell.  
M.A., Brequet, F-CMAL, London-Paris, 05.58-08.22, G., Nil, Briere.  
D.A., DH34, G-EBBS, London-Paris, 08.43-11.03, G., 6, Herne.  
H.P., DH134, G-EAUF, London-Adm, 09.50-11.03, Nil, Foot.  
K.L., Fokker, H-NABT, London-Adm, 10.00-12.31, G. & M., Nil, Hofstra.  
H.P., DH18, G-EAWX, London-Paris, 10.20-13.12, G., 4, Olly.  
I.L., DH134, G-EBBR, London-Paris, 11.46-14.31, G., 2, Holmes.  
H.P., Bristol, G-EAWY, London-Paris, 12.25-15.15, M., 7, Carter & 1.  
M.A., Goliath, F-ADAY, London-Paris, 13.30-17.03, G., 3, Challoux & 1.  
K.L., Fokker, H-NABS, Ldn-Adm, 14.07-16.32, G. & M., 1, Geyssendorfer.  
G.E., Goliath, F-GEAO, Ldn-Paris, 14.13-17.15, G., Nil, Labouchere & 1.  
D.A., DH34, G-EBBS, London-Paris, 14.52-17.01, M., 7, Hinchiffe.  
I.L., DH134, G-EBBT, London-Paris, 16.15-18.14, G. & M., 3, Jones.  
H.P., DH134, G-EAUF, London-Paris, 18.00-20.07, Nil, 1, Dismore.  
I.L., Westland, G-EARF, London-Brussels, 18.00-20.24, G. & M., Nil, Varnar.  
D.A., DH34, G-EBBS, Paris-London, 05.10-07.10, Nil, Nil, Hinchiffe.  
M.A., Brequet, F-CMAL, Paris-London, 05.12-07.54, G. & M., Nil, Donelin.  
K.L., Fokker, H-NABT, Adm-Ldn, 10.20-13.01, G. & M., Nil, Varnar.  
D.A., DH34, G-EBBS, Paris-London, 11.40-13.54, Nil, 7, Robertson.  
I.L., DH134, G-EBBT, Paris-London, 11.50-14.05, G., 3, Powell.  
H.P., DH134, G-EAUF, London-Adm, 12.03-14.16, Nil, 2, Foot.  
M.A., Goliath, F-YHMF, Paris-Ldn, 13.26-16.50, G. & M., Nil, Drauthin & 1.  
G.E., Goliath, F-GEAC, Paris-London, 14.30-17.38, G., 2, Gastou & 1.  
H.P., DH18, G-EAWX, Paris-London, 15.25-18.12, G., 5, Olly.  
K.L., Fokker, H-NABN, R'dm-Ldn, 15.26-18.52, G. & M., Nil, Pyl.  
I.L., Vulcan, G-EBBL, Paris-London, 17.00-19.23, G., 6, Barnard.  
I.L., DH134, G-EBBR, Paris-London, 17.15-19.40, G., Nil, Holmes.  
D.A., DH34, G-EBBS, Paris-London, 17.45-20.08, Nil, 2, Herne.

##### JUNE 3rd:

M.A., Brequet, F-CMAL, London-Paris, 05.10-08.10, G., Nil, Donelin.  
I.L., DH134, G-EBBT, Paris-London, 05.50-07.50, G. & M., Nil, Robins.  
K.L., Fokker, H-NABT, London-Adm, 10.00-12.32, G. & M., Nil, Varnar.  
I.L., DH18, G-EARO, London-Paris, 11.55-12.00, G. & M., 6, Keys.  
I.L., Vulcan, G-EBBL, London-Paris, 12.14-14.59, Nil, 6, Barnard.

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L.L., DH.34, G-EBBT, London-Brussels, 12.00-14.20, G. & M., 4, Holmes & Spad, W.S., G-EBBG, London-Paris, 12.10-14.50, G. & M., 6, Wilcockson & L. M.A., Goliath, F-YHMF, London-Paris, 13.19-16.00, G., 1, Dranhin & L. L.L., Fokker, H-NABN, London-Adnan, 14.00-16.00, M., 3, Pyl. G.E., Goliath, F-GEAC, London-Paris, 14.12-16.45, G., 6, Gastoux & L. D.A., DH.34, G-EBBS, London-Paris, 14.50-16.55, M., 2, Robertson. L.L., DH.34, G-EBBK, London-Paris, 16.25-18.30, Nil, 5, Shepperson. M.A., Brequet, F-CMAK, Paris-London, 16.30-19.30, G. & M., Nil, Delage. L.L., DH.34, G-EBBT, Paris-London, 16.32-18.10, Nil, Nil, Jones. L.L., Westland, G-EARF, St. Ing.-Ldn., 17.40-19.45, Nil, Nil, Courtney. K.L., Fokker, H-NABD, Adnan-London, 16.50-17.50, G. & M., Nil, Stillins. L.L., DH.34, G-EBBR, Paris-London, 17.40-19.45, G., 4, Robins. H.P., Bristol, G-EAWV, Paris-London, 17.50-19.55, G., 4, Carter. K.L., Fokker, H-NABN, Adnan-Ldn., 17.50-19.45, G. & M., 1, Gersendörfer. G.E., Goliath, F-ADDT, Paris-London, 18.15-17.32, G., 2, Favreau & L. H.P., DH.4, G-EAWH, Paris-London, 18.00-17.45, G., 3, Dismore. L.L., DH.34, G-EBBT, Brussels-London, 16.18-19.00, G., 3, Holmes. D.A., DH.34, G-EBBS, Paris-London, 17.45-20.22, Nil, 1, Robertson.

## JUNE 4th:

H.P., DH.8, G-EAWX, London-Paris, 10.20-12.50, G., 5, Rogers. D.A., DH.34, G-EBBS, London-Paris, 10.52-13.04, Nil, Nil, Robinson. L.L., DH.34, G-EBBT, London-Paris, 11.38-14.00, G. & M., 3, Brady. L.L., Westland, G-EARF, London-Brussels, 11.42-14.00, Nil, 1, Courtney. M.L., Spad, F-ADBL, London-Paris, 12.53-17.10, G., 1, Revenue. M.A., Brequet, F-ADAU, Paris-London, 13.15-15.33, G., Nil, Perignon. L.L., DH.34, G-EBBR, Paris-London, 13.35-14.02, Nil, 5, Shepperson. M.L., Spad, F-ADHL, Paris-London, 13.30-16.29, G., 3, Roby. D.A., DH.34, G-EBBS, Paris-London, 13.51-16.16, Nil, 4, Robinson. H.P., W & B, G-EBBO, Paris-London, 14.52-17.24, G., 7, Wilcockson & L. L.L., DH.4, G-EAMU, Paris-London, 15.58-18.01, Nil, Nil, Powell. L.L., Westland, G-EARF, Brussels-London, 16.50-18.27, Nil, 2, Courtney. L.L., DH.34, G-EABT, Paris-London, 16.15-18.43, Nil, 1, Brady.

## Inland Flying at Croydon.

May 29th—S.F., Avro, joy-rides (Muir); M.W., Avro, test (Shaw).  
May 30th—L.L., Westland, test (Holmes); Vulcan, test (Horsley);  
G.A.C., "Bamel" from Martlesham (James).  
May 31st—H.P., H.P., test (Cartwright); K.A., Avro, tests (Muir).  
June 1st—H.P., H.P., tests (Dismore); B.A., Bullet from Bristol (Wivins).  
June 2nd—S.F., Avro, joy-rides (Muir).  
June 3rd—A.C.C., races.  
June 4th—S.F., Avro, joy-rides (Muir).

## Cross-Channel Statistics.

Week ending June 4th.—  
Machines, 159; Passengers, 359; Crews, 207; Total Personnel, 536.  
Corresponding week last year.—  
Machines, 85; Passengers, 339; Crews, 101; Total Personnel, 440.  
Corresponding week, 1920.—  
Machines, 89; Passengers, 125; Crews, 400; Total Personnel, 226.

## The London Terminal Aerodrome.

The Daimler Airway provided the star turn of the week on Friday when the D.H.34 G-EBBS with Napier engine made five single trips in the day, a total distance of about 1,250 miles. So evidently the four schedule journeys are by no means excessive. Twenty-two passengers were carried on these trips and a fair amount of goods. Messrs. Hinchliffe, Herne, and Robertson were the pilots. The Daimler people hope to have back soon G-EBBO and G-EBBU, which were damaged last week in a mutual argument.

Handley Page Transport took delivery of the third W.8.b on Friday. She is said to be faster and lighter than her predecessors.

During the week Mr. MacIntosh was testing G-EATK, the re-Rolled O/400, after which Messrs. Larry Carter and Dismore put in some landings with the machine for their "B" licences.

The Gloucestershire Aircraft Company's "Bamel" arrived by air from Martlesham on Tuesday, Mr. James having made the trip in 35 minutes. He made one of his usual perfect landings.

The Instone Air Line received the Vickers "Vulcan" from Brooklands on Wednesday. The following day Mr. Barnard took her to France and returned the next day. On Saturday morning Mr. Barnard went to Paris with the machine with six passengers and a load of goods. The machine took off in less than two yards and climbed well. She is a very good commercial proposition. She has returned to Brooklands for final modification of detail.

On Friday evening Mr. Courtney took the Instone Westland to Berck with some special passengers and returned the same evening.

Captain Stocken has been testing some more Aircraft Disposal Company's machines during the week, including his D.H.9a with Rolls-Royce engine, for the races. On Derby Day he took one for a test in the machine during the course of which we passed over the Epsom hippodrome at 6,000 feet or more. Little could be seen of the horse chase except the closing in of the crowd after the hair-trunks had passed along the track. It seemed that that was an uncomfortable crowd and much dust, but one supposes that it is all right "for them as likes it."

On return to the aerodrome Captain Stocken proceeded to demonstrate the quick turning ability of the D.H.9a at a low level though one was already quite prepared to believe it. Still Captain Stocken evidently enjoyed himself.

Early in the week a Spad was unfortunate enough to encounter the ground with a wing tip which was damaged, but received first aid and was repaired under the eagle eye of the insurance people.

On Saturday M. Morin, flying a Spad which was one believed fitted with a Hispano-Suiza engine, fell into the channel off Folkestone and the pilot and the two occupants of the cabin were killed. At present there seems to be no satisfactory explanation forthcoming.—G. D.

## REAL COMMERCIAL AVIATION.

On Wednesday, May 31st, in connection with the Derby horse race held at Epsom, some excellent organisation by the De Havilland Aircraft Co. enabled the public in various distant towns in the United Kingdom to see films of the race within a few hours of it actually taking place.

The race took place at 15.30 o'clock. A motor-cyclist collected the exposed films from eight operators situated at various points round the course. These were taken to Barnet by an aeroplane which was waiting in a field a mile away and were there developed and printed.

When the reels, 40 in all, were ready they were ferried over to Stag Lane aerodrome by two D.H.6s, and thence seven machines delivered them to various parts of the country.

The first machine, piloted by Mr. A. J. Cobham, left Stag Lane at 17.47 and flew over York, Darlington, Newcastle, Edinburgh to Aberdeen non-stop, the film being shown there on the screen at 22.35 hours. At each of the places mentioned above films were dropped by small Calthrop "Guardian Angel" parachutes which proved really useful.

The second machine, piloted by Mr. Barnard, flew to Glasgow, dropping films at Leicester, Nottingham and Leeds.

The third machine, piloted by Mr. Broad, flew to Plymouth, over Bristol and Exeter, dropping films at those places.

The fourth machine, piloted by Mr. Herne, delivered films at Liverpool and Manchester, the latter by parachute.

The fifth machine, piloted by Mr. Wilson, flew to Birmingham, back to Worcester and thence across to Peterborough, going to Birmingham first to defeat the fairly rapid train service.

The sixth machine, piloted by Major Foot, dropped films at Brighton and Portsmouth.

All the above machines were D.H.9s (230 Siddeley "Pumas").

The seventh machine, a D.H.6, piloted by Mr. Dickinson, flew to Sutton with a film to show those people who live in a stone's throw of the Epsom course that a race took place there some time during that afternoon.

In all 40 films were delivered, without a single failure, in record time, and everyone was shown at the various picture palaces during the same evening. Truly a remarkable piece of delivery work, and well up to the standard of previous accomplishments of the De Havilland Aircraft Co. in this line.

## THE ADVENTURES OF MAC, BROOME AND WILFRED—III.



MY DEAR PETS AND GROUND WALLAS,—

You will be pleased to hear that after a sunshiny time in Paris the three gallant Pets set off again on their flying game, and Le Bourget thought they had seen the last of them. But they had reckoned without Wilfred. However I will come to that in a minute.

Off they flew to the ends of the great big world which they found at Lyons. They had to cross the Alps but couldn't and Wilfred "un-nuenced" and thought what a lively rabbit warren they would make. He is enjoying himself immensely and loves to think that he is flying the machine himself.

They flew on to Marseilles, and here I am sorry to say the horrid Anti-Wilfred-League was lying in wait and they broke their prop.

There was a great shortage of carrots here, so, glad of the opportunity, Wilfred rushed back to Paris by train and surprised Le Bourget by asking in a plaintive way for a prop. I am sorry to say that there are some members of the A.W.L. at Le Bourget, and it was some days before Wilfred got away again.

But as I said I thought they would be last week, they are now at Marseilles where we will leave them till next week, where they probably will be unless the great big world gets a move on with its turning.

Your affectionate Uncle.—G. D.

## THE BUYERS' GUIDE WEEK BY WEEK.

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"Ancwtoyile," Vic, London. Victoria 2527-8.	413	"Tetrafree," Picky, London. Gerrard 2312, Regent 4728.	Front Cover & 413
<b>AEROPLANE MANUFACTURERS.</b>		<b>ENGINES.</b>	
Blackburn Aeroplane and Motor Co., Ltd., The Olympia, Leeds.		Bristol Aeroplane Co., Ltd., The, Filton House, Bristol. "Aviation," Filton. Bristol 3906.	Back Cover
"Propellers," Leeds. Roundhay 601 (5 lines)		Green Engine Co., Ltd., The, 166, Piccadilly, London, W.1.	
Bristol Aeroplane Co., Ltd., The, Filton House, Bristol. "Aviation," Filton. Bristol 3906.	Back Cover	"Airengine," London. Gerrard 3105.	Back Cover
De Havilland Aircraft Co., Ltd., The, Stag Lane Aerodrome, Edgware.		Rolls-Royce, Ltd., 15, Conduit Street, London, W.1. "Rolland," Picky, London. Mayfair 6340 (4 lines)	405
Roe, A. V., & Co., Ltd., Newton Heath, Manchester. "Triplane," Manchester. City 839-1.	Inside Front Cover	<b>FLOTATION AIR BAGS.</b>	
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"Vickers," Vic, London. Victoria 6900.	406	Esher 365.	416
<b>AIRCRAFT DISPOSAL.</b>		<b>INSTRUMENTS (Speed Indicators, etc.).</b>	
Aircraft Disposal Co., Ltd., The, Regent House, Kingsway, London, W.C.2. "Airdisco," Phone, London. Regent 6400 (5 lines)	Inside Back Cover	Smith, S., & Sons, Ltd., 179-185, Great Portland Street, London, W.1. Mayfair 6330 (6 lines)	413
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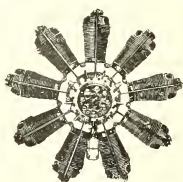
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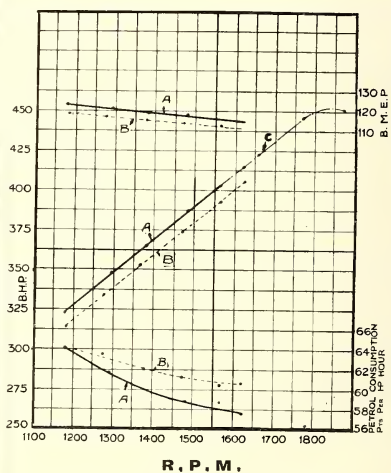
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Power Readings corrected for atmospheric pressure.



# THE AEROPLANE

WEDNESDAY, JUNE 14, 1922.

Edited by  
C. C. Grey

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SIXPENCE WEEKLY.

[Registered at the G.P.O.  
as a Newspaper.]

## ON THE RANK.



**REAL COMMERCIAL AVIATION.**—The fleet of De Havilland 9 ("Puma" engine) taxis which were used to distribute Derby films all over Great Britain, standing on their rank at Stag Lane, waiting to start on May 31st.

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## ON SIR FREDERICK SYKES: HIS BOOK.

[AVIATION IN PEACE AND WAR: by Sir Frederick Sykes, G.B.E., K.C.B., C.M.G., Late Chief of the Air Staff and Controller-General of Civil Aviation. 139 pp. Edward Arnold & Co., 8/6 net.]

It seems possible that it would have been better for General Sykes' reputation as a soldier and as an historian and as a politician if the contents of this book had remained in the comparative obscurity in which they originated as Leeson-Knowles Lectures delivered at Cambridge University in February and March, 1921. The matter contained therein purports to be a review of Service aviation from its earliest days to the present. From a military point of view it suffers from fallacies. Historically it suffers from sins of omission and commission. And politically, in the larger sense of the word, it suffers from erroneous ideas.

In the first paragraph of the introduction the author states quite accurately that "since the earliest communities of human beings first struggled for supremacy and protection the principles of warfare have remained unchanged." Which is quite according to Clausewitz. Yet in the second paragraph he says, "no discovery, save perhaps that of gunpowder, has done so much in so short a time to revolutionise the conduct of war as aviation." Even admitting the difference between "principles of warfare" and "the conduct of war," one submits that aviation far from revolutionising the conduct of war has on the contrary had distinctly a reactionary effect. In France it put an end to a war of movement and produced the most elementary form of war, hand to hand fights between cave men. In Palestine it brought back the great days of cavalry. In East Africa it drove our enemies into becoming jungle folk.

As to the future of aviation it is likely to take us still farther back. In fact in the late lamented war we had already begun to touch the state in which every inhabitant of the warring nations took an active part in the war, as in the early days when tribe fought tribe and there was no distinction between the Army and the People. Which is what war should be if nations are to learn from war that peace is good.

### A Scientific Fallacy.

General Sykes says, "We may indeed feel anxious about this great addition of aviation to the destructive power of modern scientific warfare." Surely he, as a trained soldier, must have known and therefore ought to have stated that modern scientific warfare is a bogey in that the percentage of casualties in scientific warfare are very much lower than they were in the days of hand-to-hand warfare in the open. Taking the whole tactical area into consideration no battle in the late war produced anything like the percentage of deaths which occurred at Canne, or Marathon, or Flodden. And when the Air Force of one nation invades another over the heads of fortified frontier guards the casualties in the invaded countries will not approach those in the countries which were swept by Attila or Tamerlane or Alp Arslan.

The destruction of property will be greater because there is more to destroy, but the loss of life will be less. And the war will stop when the property-owners have had enough. Moreover, an air war will be so much cheaper than a ground war or a sea war that everything is in favour of air warfare.

Therefore "modern scientific warfare" instead of being held up as a bogey, ought rather to be regarded as a welcome relief. Surely it is more pleasant to go out in a nice clean impersonal explosion or with a quiet dose of lethal gas than to submit to torture and rape and burning and personal murder as practised by the Bolshevik friends of the author's political allies.

The foregoing may be taken as an example of General Sykes' view of militant aviation. It is hardly that of the average intellectual soldier.

### Historical Inaccuracies.

As to his historical accuracy he states that the first free

flight in Europe was made by the Dane, Ellehammer, on September 13th, 1906. Of course it is possible that General Sykes may have inside information on this point, but it is generally accepted that the first European flight was made by Señor Santos-Dumont on August 22nd, 1906, in France.

That is a minor matter, but there is no excuse for the following:—"The question of forming an Allied squadron to bomb German munition factories was first raised in 1915 at one of the monthly meetings between the French and British Aviation departments; and in February, 1916, a small squadron of Sopwith '1½ Strutters' was formed at Detling for the purpose of bombing Essen and Düsseldorf from England, but the Army in France, being short of machines, asked that they should be sent to the front, and therefore the scheme did not mature; neither, for similar reasons, did one for the co-operation in 1916 of British and French bombing squadrons, operating from Luxeuil."

As to the Detling proposition, it is possible that somebody in the R.N.A.S., being part of the Navy, may have been crazy enough to think that a machine with a rotary engine could get to Germany from England and return, but personally one cannot recall the scheme. But as to Luxeuil one can state definitely that General Sykes is quite wrong.

Captain Elder, R.N., commonly known as "Daddy" Elder, had at least 100 aeroplanes at Luxeuil, mostly Sopwiths. They made numerous raids, both in conjunction with the French and alone. They would have made many more but for either the tenderness of heart or the lack of decision of the commanding officer, who never sent his people up if there were any clouds about.

In one raid a Wing-Commander was shot down and captured. In another one squadron lost 15 machines. In another a bomb fell into a circus at Karlsruhe and slew a lot of women and children, of which the Germans made great propaganda.

If General Sykes calls that a scheme which "did not mature," one would like to know what he calls a matured scheme. At any rate it came nearer maturity than did that grandiose scheme for airship mooring masts all the way from Pulham (Norfolk) to Sydney (New South Wales).

### Historical Omissions.

His historical omissions are not less remarkable. Discussing the earliest days of the R.F.C. he says:—"A Technical committee was formed, consisting of Brig-General Henderson, Major McInnes of the directorate of Military Training at the War Office, a splendid officer who died during the war, and myself." That is the sole mention in the book of the late Sir David Henderson, the founder of British Military aviation, a great soldier and a very great gentleman, who was at that time Director of Military Training, and the friend and patron of Major Frederick Sykes as he then was.

Similarly it is strange that one finds no mention of Captain Fenton, who commanded No. 2 Company of the Air Battalion, R.E., which was the first aeroplane unit the British Army ever possessed. Major Fulton, as he had become, also founded and organised the Aircraft Inspection Department, the famous A.I.D., which, whatever its faults, did certainly give us the most reliable and best built aeroplanes of all the belligerent nations. The omission is the more curious considering that the names of officers who commanded units of the R.F.C. without remarkable distinction are mentioned.

Also it is something very like an achievement to have written a book which mentions, anyhow, a couple of dozen names of officers who have helped in minor or major degree to make the history of the Flying Services, and yet to have escaped mentioning such names as Trenchard, Schmond, and Sauer, three only of a series of remarkable omissions. A mind which is subject to such curious lacunae, can scarcely be regarded seriously as that of an historian, especially as its memory for quite unimportant people seems to be correspondingly bright. The results are apt to be misleading in that they create false relative values in the mind of the unsophisticated reader.

On the other hand it is only fair to state that General Sykes'

account of the development of successive types of aeroplanes and engines for specific purposes is so reasonably accurate, if a trifle disjointed. Therefore those who read the book with a fairly good preliminary knowledge of Aviation in War will find a good deal which will refresh their memories. Also here and there one comes across details which were within General Sykes' personal knowledge and throw light, or at any rate interesting side-lights, on matters which may have been obscure to the reader.

### Military Super-Sight.

When he comes to write of Aviation in Peace (more or less as a preliminary to war) General Sykes ventures boldly into the realm of pure conjecture, which was only to be expected from one who has always been noted for being so far-sighted as to lose sight on occasion of the very next step. For example, he says, "Cavalry, unless retained, as I think they should be, in the form of mounted machine-gunners, will, I think, disappear in European warfare, but infantry will remain, and it will be the object of aircraft to assist their advance by reconnaissance, ground attack, artillery and tank co-operation, and the destruction of the enemy's supplies and communications."

One agrees that aircraft will do all that, and more. But when the Great War against the Slavs has to be fought over the Central European Plain, with the fighting line extending roughly from Dentic to the Adriatic, it will be found that cavalry will return to something very like their importance in medieval war. When aeroplanes and tanks—tactically employed in a proper manner for the first time—have broken up the enemy's fixed positions and strong points the cavalry will get home with the *arme blanche* among the Slav hordes as nothing else on earth can do.

Neither tanks nor aeroplanes can hunt down the individual man, and infantry will be too slow in their movements to be of use on those great plains. It will be waste of time for mounted infantry or mounted machine-gunners to dismount and fire. The weapons of the day will be the lance and sabre chasing the enemy over open country while the aeroplanes block the roads by bombing the enemy's transport, as they did in Allenby's great victory in Palestine.

### False Analogies.

It is when General Sykes discourses on "Civil Aviation as a Factor in National Security" that one disagrees from him most heartily. Seeking for an analogy, he says:—"The Navy owed its origin to our mercantile enterprise and to-day it depends upon the Mercantile Marine for its reserve power of men and material. In the same way must air power be built upon on commercial supremacy," and he quotes Admiral Mahan, U.S. Navy, as saying "Sea power is based upon a flourishing industry."

Admiral Mahan is perfectly right, but General Sykes is as perfectly wrong. He would have us believe that the Services depend on Trade whereas it is as true to-day as ever it was that "Trade follows the Flag." England became rich under Alfred the Great because Alfred raised a great Navy, and Trade followed his flag. Alfred is commonly regarded as the founder of the British Navy, but as a matter of fact the real founder of British Sea Power was Carausius, who in A.D. 287 rebelled against the Emperors Diocletian and Maximian and "self-determined" himself as Emperor of Britain.

### British Sea-Power.

Carausius had been admiral of the Roman Fleet at Gessoriacum (now Boulogne) and by ingenious use of Sea Power not only obtained possession of Britain, but compelled the Emperors of Rome and Gaul to acknowledge him as a colleague and equal. As Gibbon says in his fine rolling periods:—"His fleets rode triumphant in the Channel, commanded the mouths of the Seine and of the Rhine, ravaged the coasts of the ocean, and diffused beyond the columns of Hercules the terror of his name. Under his command, Britain, destined in a future age to obtain the empire of the sea, already assumed its natural and respectable station of a maritime power."

Whenever British Sea Power has declined, British trade has declined with it, as in the time of Charles II.—*vide* Mr. Pepys. Thus "Trade follows the Flag" both in advance and retreat. When Admiral Mahan said that Sea Power is based upon a flourishing industry, he evidently meant that firms which can build war-ships must be maintained in a flourishing state by orders for war-ships judiciously distributed and that ship-building must not be the monopoly of one firm.

If General Sykes knew anything about ship-building, he would know that the building of war-ships and of commercial ships are two entirely different trades. Harland & Wolff, who have built the world's best passenger ships, have never built a war-ship, and if some of the Clyde and Tyne firms have built both they have built them in different yards and designed them in different drawing-offices. And their com-

mercial yards have been in many cases financed by the profits from their war-ship orders.

### Trade and the Flag.

Similarly, "Trade follows the Flag" in aviation. If we are to have a great commercial air fleet it must follow the building up of a great Air Force. Both General Sykes in this book, and his *hâns Ackates*, Brig-General P. R. C. Groves, in his voluminous articles in the *Times*, suffer from the same bee in both their bonnets. They will insist that a great Air Force can only be built up from commercial aviation. And they argue, by false analogy, on the work of our Mercantile Marine in the late war.

It is quite true that the Mercantile Marine did nearly all the useful sea work in the war. But that was merely because the Navy was practically useless except for a Fleet action, which only happened once in the four years. A few Naval officers of the kind who were regarded as eccentric by the stereotyped product of Dartmouth and Osborne did queer business with "Q" ships and submarines and destroyers and free-lance affairs of the *baralong* breed. But taking it all round the Navy was hide-bound, case-hardened, and bone-headed. Therefore the Mercantile Marine, which had been built up in the days when the Navy was showing the Flag all over the world, had to do the work which the Navy ought to have done.

It was as if we now proceeded to build up a vast Air Force which produced a healthy and wealthy Aircraft Industry, so that the said Industry could afford to build real commercial aircraft and man them with time-expired R.A.F. personnel, and then let our Air Force run to seed, so that in the next war we had to depend on the bye-products of a once great Air Power.

### Our False Policy.

As a matter of fact we are doing something very like it to-day. Our Air Force has been cut down almost to nothing and it is mounted entirely on obsolete aeroplanes. If we were thrown into a real war to-morrow we should have to depend on civilian personnel and on a few modern civilian aeroplanes to augment our nucleus First Line of Defence until the Aircraft Industry could produce up-to-date war machines and until the R.A.F. had trained people to fly them.

Generals Sykes and Groves would have us believe, if you please, that the remedy for this is to build commercial aeroplanes in large quantities, and to train new pilots to fly them. They have got the whole idea wrong way round.

To begin with, we have not the foggiest idea what a commercial aeroplane is like. The only thing that is certain is that it resembles in no way the apparatus we call a commercial aeroplane to-day. But when we do discover a commercial aeroplane, we may be sure that it will be as much like a war machine as a motor omnibus is like a tank.

Also we may be sure that the genuine air-line pilot, a middle-aged, sober-minded family man, used to flying absolutely stable foot-proof aeroplanes guided yard by yard along a properly observed and wirelessly controlled route in all sorts of weather, will be about as much like the war pilot as the driver of a tube train is like Count Zborowski or Mr. "Bill" Guinness driving their racing cars within inches of the top of the banking at Brooklands.

### Sound French Policy.

General Sykes says:—"French policy is fostering civil aviation as a part of its military policy and, a portion of the subsidy being given to machines fulfilling Service requirements, there is a strong tendency for French civil aviation to be military power camouflaged. British policy, on the other hand, should aim at fostering civil aviation primarily as a commercial concern, and believes that air commerce is the basis of air power as a whole."

One can only say that French policy is right and that if British policy is as General Sykes states (which one does not believe), then we are bigger fools than one believes us to be. Anyhow, the result is that even if French commercial aeroplanes do come within the generic heading of "Duds," the French have in the Nieuport type 29 a fighting machine which is miles an hour and thousands of feet better than anything the R.A.F. has got, and that the ingenious M. Delage is now preparing for the *Service d'Aviation Militaire* something which is a great deal better. Meanwhile the R.A.F. is carrying on with Sopwith "Snipes," built in 1917, by a firm which is now in liquidation, and with Nieuport "Night-hawks" which were built in 1918 by a firm which is no longer operative, both types being utterly obsolete according to modern ideas.

### What Our Policy Should Be.

The only sensible policy is one diametrically opposed to that of General Sykes. It is this:—



Let us begin by enlarging and re-equipping the R.A.F., so that it may become an adequate First Line of Defence. That will give us more trained mechanics and more trained pilots. Also it will establish the Aircraft Trade as a flourishing industry—according to the Mahan doctrine.

When the Aircraft Trade is flourishing it will be able to afford to experiment with variable cambered and slotted wings, with properly formed bodies, and with heavy oil engines, so that in a few years it will have produced genuine commercial aeroplanes which can be run at a profit without wasting money on subsidies.

The commercial air fleet thus produced will absorb the time-expired officers and men of the R.A.F., who will thus constitute a real R.A.F. Reserve, just as the best of the R.N.R. are old man-o'-war-men. The older pilots will either become men of importance in commercial aviation or they will tone down into regular air-line pilots nursed by wireless. The younger pilots will go and pioneer new air lines in the Colonies (the Columns of the Empire, commonly called the Dominions Overseas) where there will be at first: no wireless to nurse them and no prepared landing grounds or harbours.

Thus and thus can commercial aviation develop along healthy lines. Our present system of cocking up day after day with subsidies for flying empty aeroplanes, and with free loans of aeroplanes ostensibly hired with money which is paid out of the subsidy is as enervating as bringing up a baby on soothing syrup instead of letting it yell and expand

its lungs. The surest way to kill our Air Power is to adopt the Sykes and Groves method of trying to make the Flag follow Trade.

### The Reason.

Considered purely as a book, General Sykes' essays do not warrant the space which is now given to them in the attenuated pages of *THE AEROPLANE*. But the rank of their author and his former eminence as Chief of the Air Staff and Controller-General of Civil Aviation, have secured for the book extensive reviews in the untechnical press, evidently written by people whose knowledge of military affairs and of aviation and of *Welt-politik* are equally slight. Therefore it has seemed necessary to deal with the book somewhat fully so that readers of this paper in general and the personnel of the R.A.F. in particular may see for themselves some of the fallacies therein and may be helped to controvert arguments which they are likely to meet from those outside the aeronautical community.

When such arguments arise it will be well to base all counter-attacks on the well-proved maxim that "Trade follows the Flag." The R.A.F. is the solid foundation on which real Air Power in Peace and War can be built. If commercial flying is to become a financial success, as one believes it will, its success will be based on the growth in size and efficiency of the R.A.F. Civil aviation may well be left to look after itself until we have secured our First Line of Defence.—C. G. G.

## R.A.F. INTELLIGENCE.

### R.A.F. Appointments.

AIR MINISTRY, May 10th.

Air Vice Marshal L. F. A. Higgins, C.B., D.S.O., A.F.C., from R.A.F. Depot, to H.Q. I.A., for duty as Air Officer Commanding, Vice Air Marshal Sir J. M. Salmon, K.C.B., C.M.G., C.V.O., D.S.O., 26/5.

The following for duty with British Section Inter-Allied Aeronautical Commission, Garmisch, Germany, 5/5:—Grp. Capt. J. A. Priest, D.S.O., from I.A.A.D., Wing (Cmdr.) W. W. Smith-Tigott, D.S.O., from Inter-Allied Aeronautical Commission of Control (Germany); S/Ldr. J. H. Herrington, D.S.O., M.C., from No. 7 Group H.Q.; P/Lt. R. S. Booth, A.F.C., from School of T.T. (Men).

S/Ldrs. A. C. Mann, C.B.E., D.S.O., from Aeroplane Experimental Est., to command No. 31 Sqdn. (India), 6/5; V. S. Brown from Instruments Design Est., to command No. 34 Sqdn. (Iraq), 6/5; P. C. Sherren, M.C., from R.A.F. Depot to Half-pay List, 12/5.

F/Lts H. V. Jerrard, from R.A.F. Depot, to Stores Depot (Iraq), 6/5; W. A. Kingston, from H.Q. C.A., to H.Q. R.A.F. Iraq, 6/5; A. Croft, from R.A.F. Depot, to R.A.F. Depot, for duty as P. Officer, from 47 Sqdn. to No. 2 Armoured Car Company (Middle East), for Armoured Car duties, 24/4; A. F. Brooke, from No. 27 Sqdn. (India), 24/4; J. E. Sutherland, from R.A.F. Depot, to R.A.F. Depot, for duty as H. Houghton, A.F.C., from R.A.F. School (India), to No. 27 Sqdn. (India), 7/4; C. R. Keary, from No. 1 Wing H.Q. (India), to No. 20 Sqdn. (India), 15/4; G. C. Pirie, M.C., D.F.C., from School of Army Co-operation, to No. 4 Sqdn., 17/5; H. G. White, from No. 4 Sqdn. to School of Army Co-operation, 17/5; K. B. Lloyd, A.F.C., from H.Q. P.A.F., Middle East, to R.A.F. Depot (Superannuary), 27/4; J. B. Woodrow, from Research Laboratory and M.O.S. of I., to R.A.F. Depot, for duty as M.O., 15/5; Hon. S/Ldr. E. A. Aldridge, M.C., B.A., from Research Laboratory and M.O.S. of I., to No. 1 School of T.T. (Boys), for duty as M.O. at R.A.F. Hospital, Harrogate, 15/5; J. C. Jones-Williams, M.C., from R.A.F. (Cdnr) Col. (F.W.) to R.A.F. Depot (Superannuary), 15/5; T. J. Thomas, M.B., from E.R.D. to No. 4 F.T.S. (Middle East), 29/4.

The following from No. 230 Sqdn. to School of Naval Co-operation and Aerial Navigation:—F/Lts H. V. Worrall, D.S.C., 7/5; C. W. Bailey, 28/3; E. J. Webster, D.F.C., 28/3.

AIR MINISTRY, June 8th.

Wing/Cmdr. Francis E. T. Hewlett, D.S.O., O.B.E., from H.Q. (C.A.) to R.A.F. Depot, Superannuary, 26/5.

S/Ldrs. A. B. Gaskell, D.S.C., from R.A.F. Base, Leuchars, to H.Q. (C.A.), 1/6; J. C. Wood, from Half Pay List to R.A.F. Depot, Superannuary, 1/6; E. A. Rice, M.C., from No. 6 Sqdn. (Iraq), to R.A.F. Depot, Superannuary Non-effective, 21/4; E. Rivers-Smith, M.B.E., from Stores Depot, Egypt, to R.A.F. Depot, Superannuary Non-effective, 9/5; D. G. Donald, D.F.C., A.F.C., from R.A.F. Base, Leuchars (No. 3 Sqdn.) to command R.A.F. Base, Gosport (No. 3 Sqdn.), 1/6; P. W. Guard, C.M.G., C.V.O., from R.A.F. Depot, to School of T.T. (Men), 22/5.

F/Lts L. G. Le Blount-Crook, from Composite Flight, R.A.F. Base, Gosport, to No. 3 Sqdn., Gosport, 1/6; A. W. Symington, M.C., from No. 3 Sqdn. to R.A.F. Depot, Superannuary, 1/6; J. E. Hunter, M.C., from R.A.F. Base, Leuchars (No. 3 Sqdn.) to R.A.F. Base, Leuchars (No. 3 Sqdn.), 1/6; C. Bonnyfresh, D.F.C., from R.A.F. Base, Leuchars (No. 3 Sqdn.) to R.A.F. Base, Gosport (No. 3 Sqdn.), 1/6; E. R. Openshaw, from R.A.F. Base, Leuchars (No. 3 Sqdn.) to R.A.F. Base, Gosport (No. 3 Sqdn.), 1/6; G. F. P. Warren, from No. 1 School of T.T. (Boys) to School of T.T. (Men), 1/6; W. B. Higgins, from R.A.F. Depot to School of T.T. (Men), 22/5; E. C. W. Fitzherbert, D.S.C., from R.A.F. Depot, to R.A.F. Base, Gosport, Superannuary, 29/5; E. J. Cooper, D.S.C., from No. 230 Sqdn. to Marine and Armament Experimental Establishment, 4/5; W. J. Hunter, M.B.E., from R.A.F. Depot to Marine and Armament Experimental Establishment, 25/5; Trevor E. Salt, A.F.C., from No. 36 Sqdn. to No. 216 Sqdn., Superannuary, 18/4; C. Hanson-Abbott, from No. 230 Sqdn. to Marine and Armament Experimental Establishment, 4/5; W. H. Park, M.C., D.F.C., from Aircraft Depot, Egypt to No. 8 Sqdn., 25/1; J. C. M. Hay, from Aeroplane Experimental Establishment to No. 2 Armoured Car Coy. (M.E.), 11/4.

AIR MINISTRY, June 12th.

Wing/Cmdr. T. O. Lyons, O.B.E., from H.Q. R.A.F., Iraq, to R.A.F. Depot, Superannuary Non-effective, 1/6.

S/Ldrs. A. J. O. Wigmore, M.B., from Palestine Wing H.Q., to No. 14 Sqdn., 26/4; H. J. F. Hunter, M.C., from No. 12 Sqdn. (Rhine), to R.A.F. Depot, Superannuary, 25/5; A. J. Barr, Capt. H. C. Ellis, C.B.E., from 4 S.S.P., to R.A.F. Depot, Superannuary, 1/5.

F/Lts R. B. Mansell, O.B.E., from No. 4 F.T.S., to No. 47 Sqdn., 8/5; E. N. E. Waldron, from No. 4 Stores Depot, to R.A.F. Base, Leuchars, Superannuary, 22/5; J. M. A. Cooper, M.C., from Research Laboratory and M.O.S.I., to R.A.F. Depot, 22/5; W. H. L.

O'Neill, M.C., from R.A.F. Base, Leuchars, to No. 2 F.T.S., 1/6; C. E. Waddle, from R.A.F. Depot, to No. 24 Sqdn., 29/5; P. J. Wiseman, from Central Pay Office, to I.A.A.D., 25/5; N. R. Fuller, from R.A.F. Depot, to No. 4 S.D., 29/5; L. Wainless-O'Gowan, from R.A.F. Depot, to No. 10 Group H.Q., Superannuary, 1/6; Andrew R. Koudel, from R.A.F. Depot, to 1312 Sqn. R.A.F. (Middle East), 10/5; K. B. Lloyd, A.F.C., from R.A.F. Depot, to No. 2 F.T.S., 1/6; A. E. Jenkins, from M.T. Repair Depot, to R.A.F. Depot, for duty as Medical Officer, 5/6.

### The Opportunity of the Short Service Officer.

The attention of officers holding Short Service Commissions is particularly directed to Air Ministry Weekly Order No. 417, dated June 1st.

There is in the R.A.F. quite a large number of Short Service Officers who wish to earn Permanent Commissions. Those of them who have intelligence realise that the only way in which a Short Service Officer can assure his getting a Permanent Commission is to render himself indispensable to the R.A.F. If a man shows himself to be not only a leader of men, a good disciplinarian and a smart officer but also becomes a specialist in some branch of Air Force work then it is evident that the R.A.F. authorities are not going to let him go at the end of his period of service.

Hitherto the difficulty of the Short Service Officer has been that it has not been possible for him to take special courses in those subjects which are most valuable to Permanent Officers. In fact the only special courses that have been open to Short Service Officers have been short courses in subjects which are of minor importance. The long courses in the most important subjects have hitherto only been open to those already holding Permanent Commissions.

Therefore Short Service Officers who intend to obtain Permanent Commissions will be particularly interested to read paragraph IV of A.M.W.O. 417, which reads as follows:—

"As a general rule the majority of the Officers for long courses will be selected from those holding Permanent Commissions, but it is intended that opportunity shall also be given to Officers holding Short Service Commissions who show exceptional keenness and interest in technical matters."

Both Permanent and Short Service Officers should also pay particular attention to paragraph II of the same Order, which reads thus:—

"Whilst it is one of the fundamental principles on which the Royal Air Force has been constituted that every Officer on the general list should be trained and be prepared to fly as a pilot, it is not intended that the duties of Officers on that list should end with their flying work. They will also be required to carry out all specialist duties that may be called for in the Royal Air Force, and for this purpose will be posted from time to time to all the specialist posts allowed in the establishments. Such service, if the Officer is qualified as a Specialist Officer in addition to maintaining his flying qualifications, will be highly commended as regards promotion; in fact it is possible that in the near future qualification as a specialist may be regarded as necessary in the case of Officers holding Permanent Commissions before promotions can take place."

Both these paragraphs are to be highly commended. Paragraph II will remove the idea that when once an Officer has obtained a Permanent Commission he has only to sit tight and perform routine duties and be promoted in due

course after so many years' service in his various ranks. It assures that the keen, intelligent, hardworking Officer who is also a competent pilot and a good Executive Officer shall obtain the promotion which he deserves. But the great thing is that paragraph IV opens to Short Service Officers opportunities which hitherto have been closed to them.

### The R.A.F. Pageant and Gathering.

The most important dates to remember during the next ten days, are June 23rd (the date of the R.A.F. Gathering), and June 24th (the date of the R.A.F. Pageant).

Of course all readers of this paper will go to Hendon for the Pageant on the 24th. Not to see the Pageant is to be outside the pale where aviation is concerned. One hopes to publish next week some information concerning the programme.

To past and present R.A.F. personnel the R.A.F. Gathering on the eve of the Pageant is not less important than the Pageant itself. The numbers of officers and men who have already signified their intention to be present is most encouraging. A number of units have already arranged their own dinners, and the general dinner for those belonging to unorganised units is going to be a very big affair.

It may be well to note here that there will be two of these general dinners, one for officers and one for other ranks.

All who have not already booked their places should write at once to the Secretary (of their favourite unit), Room 651, The Air Ministry, W.C.2.

### The Independent Force R.A.F. Reunion.

The fourth annual reunion dinner of the Independent Force will be held at the Hotel Cecil at 8 p.m. on Monday, June 10th. Sir H. M. Trenchard, Chief of the Air Staff, who commanded the Independent Force in France, will preside.

Among those who have already notified their intention of being present are the Duke of York and General de Castellan, who commanded the French Army of the East from whose area the Independent Force operated.

Tickets, 35s. each, can be obtained from the Hon. Sec., Independent Air Force Dinner, Room A337E, Air Ministry, W.C.2.

### A W.R.A.F. Gathering.

In connection with the R.A.F. gathering on the eve of the Pageant, the Old Comrades' Association, W.R.A.F., are holding a dance at the Caxton Hall, Caxton Street, Westminster, for members and their friends. The dance will begin at 7 p.m. and flannels may be worn. Tickets (3s. 6d. inclusive) can be obtained from Mrs. Hollis, 41, Gloucester Street, S.W.1, before June 25th.

### The R. M. Groves Memorial Prize Essay Awards.

The awards in the 1921 competition for the R. M. Groves Memorial Essay on "A Forecast of Aerial Development," open to all members of the R.A.F., are as follows:—

First Prize.—(£30 and books)—Wing/Cmdr. C. H. K. Edmonds, D.S.O., O.B.E., R.A.F. Staff College, Andover.

Second Prize.—(£20 and books)—Wing/Cmdr. H. Verney, O.B.E., R.A.F. (Cadet) College, Cranwell.

Third Prize.—(£10 and books)—P/Lt. W. P. Groves, British Delegation, Air Section, Paris.

A special prize of £10 is also given for the best imaginative resumé on "Aviation in the next World War." On this occasion the prize has been awarded to P/Lt. W. P. Groves, the winner of the third prize.

### Long Service and Good Conduct Medal Awards

The long service and good conduct medal has been awarded to the undermentioned airmen:—

305, S.M.I. Edwards, A. (with effect from 12/8/21); 87,631, S.M.I. Keen, R. S. (3/12/21); 166,114, S.M.I. Franklin, A. (5/1/22); 186,074, S.M.I. Hill, J. (1/2/22); 147,400, S.M.2. Whitley, H. L. (5/1/22); 185,145, S.M.2. Simmonds, J. (7/5/21); 313,624, S.M.2. Bird, L. M. (4/5/21); 133,516, F/Sjt. Barnes, E. W. (1/5/22); 187,852, F/Sjt. Hunter, F. R. (17/1/21); 313,853, F/Sjt. Parry, T. (3/4/21); 428, Sjt. Brown, J. C. (7/10/21); 302,885, Sjt. Riches, H. J. (16/2/22).

Certificates have been awarded to the undermentioned airmen:—

314,868, S.M.2. Hughes, A. J. (1/1/22); 237,555, F/Sjt. Trowbridge, G. J. (4/1/22); 314,937, Sjt. Devlin, J. (1/1/20).

### Issue of War Medals to ex-Airmen.

The War Medals (1914 Star, 1914/15 Star, British War Medal and Victory Medal) are now being issued to ex-airmen.

Any person entitled to medals by service in the R.F.C. and R.A.F. who has not yet received them should therefore make application to the Officer I/C R.A.F. Record Office, Rushlip, Middlesex, stating his regimental number and rank on demobilisation and the address to which he desires the medals to be sent.

### THE ROYAL AERO CLUB BANQUET.

At the banquet which is being held at the Hotel Cecil on 27th inst., to commemorate the "coming of age" of the Royal Aero Club, the Navy will be represented by Sir Roger Keyes, the Army by Lieut.-General Sir Travers E. Clarke, and the Air Force by Air Chief Marshal Sir Hugh Trenchard. The Air Ministry will be represented by Capt. the Hon. F. E. Guest, Secretary of State for Air, and the Air League by the Duke of Sutherland.

Applications for tickets should be made to the Secretary, The Royal Aero Club, 2, Clifford Street, W.1.

### THE AERIAL DERBY.

The Aerial Derby is to take place on July 29th.

It is extensively rumoured that the Bristol Aeroplane Company are building, or designing, or about to build, or about to design a racing machine for the event fitted with a 400-h.p. Bristol "Jupiter" engine, the speed of which is to be more than 200 m.p.h.

Mr. "Jimmy" James will again fly the Gloucestershire Aircraft Company's "Bamel" with Napier engine, and it will be fitted with racing wings so that it will be very much faster than last year.

Mr. F. T. Courtney is to fly a Siddley "Siskin" with a 300-h.p. Siddley "Jaguar" radial engine.

Mr. Alan S. Butler will fly a D.H.37, which is a fast touring machine which the De Havilland Aircraft Company is building for him, fitted with a 275 h.p. "Falcon" Rolls-Royce.

The Aircraft Disposal Company are entering several machines and it is hoped that Capt. Stoecken will have a special machine. Other A.D.C. machines will possibly be flown by well-known Croydon pilots.

Various French entries are expected. M. Raffalovich, who so successfully ran the Le Bourget Meeting, has promised to persuade entries of Farman "Sports," Potez "Sports," a Caudron, etc., and it is also hoped that "stars" such as MM. Sadi-Lecointe and Frouval will also come over.

Unfortunately one believes that the venue will be Hendon and not Croydon owing to the persistent refusal of the Croydon board to grant a licence. Thus Croydon trams, trains, provision merchants, etc., will lose much trade and the London Terminal Aerodrome loses a good advertisement which could not fail to benefit the air lines and other concerns on the aerodrome, to say nothing of helping to replenish the public purse.—G. D.

### PERSONAL NOTICES.

#### DEATH.

HUDSON.—On June 6th, in Mesopotamia, F/Lt. Frank Neville (Babel) Hudson, M.C., R.A.F., younger son of the late Frank Hudson, of Wexhampton Grange, Halesworth, and Annie Hudson, aged 24 years and 7 months.

#### ENGAGEMENT.

VEEVES-GARTER—STARK.—The marriage will take place on June 26th between George Veeves-Garter, R.A.F., and Mary Gladys Stark, daughter of the late Dr. M. D. Stark, of Oxford.

#### MARRIAGES.

CAMPBELL—COLES.—On June 1st, at the Chapel Royal, Savoy, Lt.-Col. Hugh Campbell, C.B.E., D.S.O., T.D., formerly Scots Guards and R.A.F., to Lillian Coles, of Vancouver, B.C.

COX—BASILE.—On June 6th, 1922, by the Rev. H. D. L. Viener, Chaplain-in-Chief to the R.A.F., Dudley Fisher, Q.C., youngest son of Mr. and Mrs. H. R. Cox, to Dorothy, eldest daughter of Mr. and Mrs. Bastable, of The Gables, Woodlands, Hendon.

DANIEL—BUTTELL.—On June 7th, at Stoke-Danierel Church, Devonport, by the Rev. S. C. Benson, M.A., F.R.S., H. at Daniel, R.A.F., to Margaret Anne, youngest daughter of the late Mr. Percy Buttel and Mrs. Matthews, of Plymouth.

FLETCHER—HAY.—On June 4th, at St. Mary's, Hendon, F/Lt. Albert William Fletcher, D.F.C., A.F.C., R.A.F., a younger son of the late Cornelius and Mrs. Fletcher, of Childs Hill, N.W., to Marjorie Elliot Hay, only daughter of Dr. and Mrs. Hay, of Thame, Oxfordshire.

GERRARD—BALL.—On June 1st, Capt.-Capt. Eugene Louis Gerrard, C.M.G., D.S.O., R.A.F., youngest son of the late Mr. and Mrs. Thomas Gerrard, to Phyllis Louisa Ball, fourth daughter of the late Edward Stone and Mrs. Stone.

NAIRN—MABEE.—On June 10th, at Ottawa, Douglas Gordon Nairn, Maj. R.A.F., to Florence Muriel, daughter of Mr. and Mrs. Nairn.

NEEDHAM—LITTLEWOOD.—On June 7th, at St. Michael and All Angels, Warfield, by the Rev. F. D. Browne, M.A., of Lambrook, Capt. Evelyn Jack Needham, late Northamptonshire Regiment and R.A.F., elder son of the late Col. the Hon. H. C. Needham at the Hon. Mrs. Needham, of the Gate House, Windsor, to Mary Campbell, only child of the late Rev. B. C. Littlewood, M.A., Vicar of Warfield.

RAPER—CONYNGHAM.—On June 7th, at St. James, Spanish Place, by the Rev. Father Eustace Morogh-Bernard, Alfred Baldwin Raper, M.P., son of Walter Raper, of Gerrards Cross, Bucks, to Bessie Alice Conyngnam, daughter of the late William Andrews Tobin, of Australia, and Mrs. Tobin.

#### BIRTHS.

MALET.—On June 1st, the Mill House, Sheet, Petersfield, to Olga, wife of H. C. R. Malet, R.A.F.—a son.

TREVETHAN.—On Sunday, May 7th, at King's Lynn, to Doris, wife of F/Lt. R. M. Trevethan, M.C., R.A.F.—a son.

WHITEN-BROWN.—On May 25th, to Sir Arthur and Lady Whitten-Brown—a son.

WILLIAMS.—On Saturday, May 20th, to Hilda (nee Bishop), wife of S/Ldr. F. Cartwright Williams, O.B.E., R.A.F., 25, Lewin Road, Streatham—a daughter (Joyce).

WILLOCK.—On June 4th, at Sillcot, Birchenhead, to S/Ldr. and Mrs. R. P. Willock—a daughter.

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## THE WEEKLY COMMENTARY.

An article in this issue discusses the uses of seaplanes in tropical districts, and draws attention to certain serious practical difficulties which have been encountered by the Belgian operators of the Congo seaplane service.

Although one has no doubt that if a British firm had undertaken to exploit such a route they would have made mistakes in regard to the choice of machines and equipment quite other than those made in this case, it seems well worth while to put the facts on record for the benefit of anyone who may be ready to profit by the experiences of this pioneer service.

A brief report is given in this issue of a very interesting paper read by Dr. Hankin at a meeting of the London Aero Models Association, regarding the soaring flight of birds, fishes, and insects. If Dr. Hankin's

observations are to be entirely trusted, there is very strong evidence for his contention that soaring flight, properly so called, is a phenomenon entirely different from ordinary gliding flight, and depending upon forces quite outside of those known to the science of aerodynamics. Dr. Hankin is admittedly a very competent observer, and of his good faith there can be no manner of doubt, so that it must be held that there is a *prima facie* case for the investigation of the phenomena which lie has placed on record.

For if it can be shown to be a fact that the soaring bird depends for flight upon quite other forces than those involved in gliding flight, arguments otherwise undoubtedly valid which tend to prove that soaring is only possible with low-speed lightly loaded aircraft may be found to have lost their force.

## SEAPLANES IN THE TROPICS.

It has already frequently been pointed out in this paper that there are enormous opportunities in the more deserted regions of the earth for the development of aerial transport. Deserted regions are sometimes deserted because they are not worth exploiting. More often they are deserted because they lack those means of access which are essential if they are to be developed by human effort.

In the tropics this is particularly the case. Regions possessing vast natural resources are relatively unproductive because the only existing means of transport are slow, expensive and dangerous. The construction of railways or roads would mean a vast expenditure at least. Often physical barriers, such as mountain ranges, exist. More often dense and rapidly growing jungles make such work practically impossible. Frequently the only practicable routes pass through districts infested with disease which would make the cost in lives of such an enterprise prohibitive.

Yet over all the surface difficulties to transport there lies an atmosphere of precisely similar qualities to that which lies between London and Paris—and that atmosphere is available for the use of aircraft.

It is perfectly true that the same difficulties which make rail or road construction difficult and expensive would also add to the cost and difficulties of building aerodromes. But not always to so great an extent. Aerodromes need not be continuous—as roads of all kinds must—and often by a judicious choice a route impossible on the surface might become a perfectly feasible air route.

### THE RIVER AS A HIGHWAY.

But there remains yet another alternative. Usually in districts of the type now being considered the highways of such traffic as does exist are rivers. Some are great rivers, navigable for hundreds of miles by ocean-going steamers. Others are broken up by shallows and rapids and are navigable only by shallow draft steamers—or in some cases by canoes. Currents are often swift—channels change rapidly—and navigation at best is a slow and very often an extremely slow, discomfort and even dangerous process.

But every river of any size offers a ready-made air route for seaplanes. Apart from rivers there are such things as lakes—often of sufficient size and at sufficiently short intervals to provide frequent alighting and getting-off stations. There are many undeveloped countries answering more or less to this description in the British Empire. There are others which would welcome British enterprise which would aid in their development. Yet, except in the Dominion of Canada—where Government enterprise has carried out much very valuable pioneer work of this type—there are no British seaplanes engaged in the development of the deserted regions of the earth.

And in the meantime, the Daily Press is filled with headlines enquiring "What is wrong with Civil Aviation?" and our once predominant Aircraft Industry is moulder away.

Africa, Asia and America, have thousands of miles of ready-made air-routes available for exploitation by seaplane—but those who control civil aviation have their minds obsessed by the silly little 200 mile stretch between London and Paris—which has the one advantage of giving ample publicity—particularly to accidents—and otherwise offers every conceivable handicap to successful operation of air-transport services—and ignore the world at large and the British Empire in particular.

### THE BELGIAN CONGO SERVICE.

Presumably one day some one will wake up to the commercial possibilities offered by such conditions, and when that day arrives there will be a demand for seaplanes for colonial and tropical use. It is highly probable that many machines will be dispatched to the far corners of the earth which on arrival will be discovered to be extremely unsuitable for the purpose for which they have been ordered, and therefore it may be as well to put on record here some account of a very interesting and instructive enterprise carried out in the Belgian Congo by a concern known as the "Comité d'Etudes pour la Navigation Aérienne au Congo," usually abbreviated to C.F.N.A.C. The C.F.N.A.C. was formed under a Royal decree issued by H.M. The King of the Belgians on the 26th June, 1919. It was provided with funds to the extent of 2,000,000 francs, and the objects laid down for its existence were:—

(1) To establish an air line for passengers and mails between Stanley Pool and Stanleyville.

(2) To study the possibility of mapping the Congo by aerial photography and to carry out the preliminary work with a view to making such a map.

The enterprise was from the first regarded as experimental and the funds were limited to an amount considered sufficient for purely pioneering work—presumably further funds will become available when and as the work progresses.

So far nothing appears to have been done in regard to the photographic survey.

### THE PROGRESS OF OPERATIONS.

The air line between Stanley Pool (Kinshasa) and Stanleyville, a distance of about 1,050 miles, is now in operation. The route is divided up into three stages, each of about 350 miles in length, each with an intermediate depot and stopping place. The first stage, from Kinshasa to N'Gombe, was open to passengers in July, 1920, the second, from N'Gombe to Lisala, in December, 1920, and the third stage, Lisala to Stanleyville, in June, 1921.

Traffic, particularly in mails, has been steadily increasing

since the opening of the service. The river from Kinshasa to Stanleyville is navigable by river steamers, which take 15 to 17 days for the up-stream journey, and 12 days for the return. Flying each of these stages in one day, the air service takes three days. But it is not so much with the traffic aspect that one wishes here to deal, but rather with the difficulties in the matter of equipment.

#### TRoubles with Equipment.

The actual operations were entrusted by the C.E.N.A.C. to the "Syndicat National pour l'Etude des Transports Aériens," usually known as S.N.E.T.A. The machines adopted were one dozen Levy-Le Pen flying boats, fitted with 300 h.p. Renault engines. To house them there were provided 12 Bessoneau sheds.

The inhabitants were somewhat scornful as to the ability of the Bessoneaus to stand up to hurricanes. Actually the framings have successfully withstood three tornado seasons. But the fabric coverings rapidly failed under the climatic conditions, and it was necessary to import from Europe planking for the roofs of the sheds. These were covered with a bituminous millboard covering, and under the timber a thatch roof, serving as an insulator, was necessary to maintain a bearable temperature.

#### TRANSPORTATION AND FERMETATION.

The flying boats gave serious trouble. In the first place the hulls were too large for convenient transport by the available methods, and much trouble was incurred in getting them to their base. From Matadi, the port of debarkation, to Kinshasa, the machines were transported by narrow gauge railway. The hull crates—13 metres long—required each three trucks to accommodate them, and it was impossible to take the train round some of the curves with the crates on the trucks. Hence the train had to be stopped at each such curve and the crates unloaded and reloaded again.

Secondly, the three-ply with which they were covered failed to stand up. Fermentation of the glue occurred, which caused blisters between the plies. These spread, and sometimes burst, and continual repairs were necessary. The hulls as a whole refused to remain in any one shape. Being relatively cool and damp when on or in the river, they were rapidly baked and dried out after a short period in the air, and warped in the process. As the hulls carried the tail plane, the result was a change in trim, and a boat might be tail heavy and carry right rudder getting off, and be nose heavy and need left rudder after an hour's flying.

Repairs or replacements of damaged hulls were a very serious matter. Any large repair meant complete dismantling of the machine—a very serious matter where skilled labour is as scarce as in the upper reaches of the Congo.

The normal wooden wing structure gave less trouble—not suffering such extremes of temperature and humidity as the hull—but deformations sufficient to reduce the speed by some 35 km. per hour were sometimes discovered.

The engines themselves gave no unusual trouble. Radiators were only just sufficiently large for the climate. But the engine installation between the planes led to trouble from the inaccessibility of the engine and made it necessary often to remove a wing to carry out some quite small replacement on the engine.

It was found to be absolutely unsafe to start engines by swinging the airscrew on the pusher type of boat. A reliable self-starter is essential—particularly for restarting away from a regular base.

#### FLYING BOATS NOT SUITABLE.

In the opinion of the Belgian authorities the flying boat type of machine is definitely unsuitable for this class of work. A metal hull boat would get away from some of the troubles—but not all.

But the float type of seaplane is much more suitable for this class of work. It will provide all that is necessary in the way of seaworthiness for river work. It avoids trouble in packing and transport to the scene of operations of the large and unhandy hull unit. Distortion of the floats will have no effect on the airworthiness of the machine. Damaged or tired floats can be replaced easily without dismantling the machine. Floats can be repaired—or even built—under conditions where such work on a hull would be extremely dangerous—if not impossible. The engine can be made easily accessible for overhaul. And finally a float seaplane handles very much like an ordinary machine, and there is much less difficulty in securing competent pilots for a machine of this type than there is for the flying boat.

All these points are of appreciable importance—and they are well worth bearing in mind if and when there is any question of producing machines for river service in uncivilised districts.

#### TIMBER IN THE TROPICS.

It is perfectly obvious that for tropical river work at least

timber built craft will require very great care in their construction and design if troubles from warping are to be avoided. Very obviously, it is not safe to rely upon glue under any circumstances for such conditions. It should here be noted that certain glues are supplied or mixed with an incorporated antiseptic—usually thymol—which is supposed to prevent fermentation or other trouble due to yeasts, bacteria or ferments. There is a good deal of evidence that this treatment does not suffice to protect the glue in tropical climates. Also in certain countries, trouble has been experienced with glue joints, probably due to a mould, which cannot be discovered by inspection. Laminated spars whose joints are apparently quite tight and sound, suddenly fail under load—and after failure examination shows that the failure is not due to unequal contraction of the laminae, but to failure of the glue.

Fabric also gives trouble. Non-actinic dopes near the Equator seem to have little value.

#### THE POSSIBILITIES OF LAQUER.

A French writer mentions that fabric lacquered on both sides stands up excellently. There must be a certain difficulty in covering aircraft with lacquered fabric—but the possibilities of lacquer as a protection both for wood and fabric are worth investigating. Apparently a really well lacquered air-screw is practically immune from the effects of climatic changes—if this is the case, why not lacquered spars and struts? The weight of lacquer should not be very great, and it seems to be the only satisfactory protection for timber. And unless such protection is used metal structures seem to be imperatively necessary for river work in the tropics.

But metal construction will have its own drawbacks. It will be as necessary to protect the metal against rust and corrosion as it is timber against changes of humidity. And repairs to damaged metal parts of intricate design and delicate workmanship on the upper Congo might present a serious difficulty.

It will be recognised at once that when the development of overseas waterways by seaplanes is undertaken in earnest, some considerable thought will be necessary to produce satisfactory machines for the purpose. In many ways river work in tropical climates is likely to give more trouble in regard to the effects of heat and humidity than work with land machines over deserts, and to attempt such work with any old type of aeroplane with a pair of floats appended is likely to result in serious trouble. Nor will a seaplane designed in the light of North Sea experience be likely to prove much more satisfactory.

The design of machine for such duties presents a problem that it may well pay our designers to consider carefully in their moments of unemployment. One of these days there will be big business in seaplanes for the tropics—and that business will go to the firm who can produce a really satisfactory machine to suit the special conditions.

### THE SAFETY OF FOREIGN AEROPLANES.

The Air Ministry makes the following announcement:—

In view of the statements appearing in certain portions of the Press this morning regarding the Cross-Channel air services, the Air Ministry feels it necessary to state that it regards the allegation that existing French machines would not be permitted to fly if they were British-owned as quite unwarranted.

As a signatory of the Air Convention, Great Britain has agreed to recognise French certificates of airworthiness for French passenger aircraft, and although the French system of certification and inspection differs from that established in this country, there is at present no reason to suggest that it is any less efficient than our own.

The safety of passengers travelling by air is of course always one of the first considerations of the Air Ministry, and every endeavour has been and will be made to co-operate with the French and other Governments to that end.

[While it is of course courteous of the Air Ministry to make this announcement, the private individual is still at liberty to believe that the difference between the French system of certification and inspection and the British system is sufficient to justify a preference for British machines.—C. G. G.]

Apologies the occasion of these remarks, the Air Ministry makes the following announcement:—

In accordance with the normal procedure the Inspector of Accidents in the Air Ministry is investigating the circumstances which led to the unfortunate accident to the Spad aeroplane on June 3rd. Owing to the complete loss of the machine and absence of any survivors, the evidence available is extremely limited, and may not justify any definite conclusion as to the cause of the accident, but at the conclusion of the official investigation a further statement will be made.



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## DR. HANKIN ON SOARING FLIGHT.

On Thursday, June 8th, Dr. Hankin, the well-known observer of soaring birds, gave a lecture before the London Aero-Models' Association, which was of very great interest.

Dr. Hankin firstly expressed his thanks to the Association for having given him the opportunity of placing before them the results of his observations. He had hitherto found aeronautical people to be provided with very ample waste paper baskets to which he consigned all his observations, and it was very gratifying to find at last someone who would listen to him.

Neither he nor anyone else had yet advanced any theory to fit with the facts. Observation was at present the only guide available. Explanations had been offered—but they all failed to fit the facts and involved the supposition that he was guilty of errors of observation which would do discredit to a child of five. The evidence that birds could fly without effort was overwhelming.

There was no evidence that man—if he discovered the way—could not do likewise. The German experiments proved that man already had the necessary skill—but he doubted if the Germans had actually soared. Apparently they had only glided—sometimes in ascending currents—but gliding in ascending currents was not soaring.

He thought the German gliders were too lightly loaded for soaring—the loading of soaring birds increased with their span—and the Germans used loadings appropriate to spans of under 10 ft. on much larger machines. The flying fish, which was in some ways the most remarkable of soarers, was right out of the bird class in this respect, and had a wing loading eight times as great as that of soaring birds of the same size. It soared at about the same speed as birds, and the minute muscles of the fish proved that its flight could not be due to muscular effort. At the beginning of flight, to get up soaring speed, the fish kept its tail in the water and flapped that—not its wings.

The wings of all soaring birds, fishes and insects were unlike aeroplane wings. For slow speed gliding or flapping flight they were used with a camber and a positive angle of attack. For soaring flight the camber vanished, and the angle of incidence diminished. Speed of flight was increased by rotating the wings to an enormous negative angle of attack momentarily.

All soaring wings were characterised by transverse ridges

on the under surface at right angles to the direction of flight. Generally, it seemed that the better the soaring qualities the more marked these ridges. In poor soars' ridges were faired off on their forward edge and square on their rear edge. In better soars they were square on both sides. In the flying fish these ridges, formed by the finrays which stiffen the wing membrane, were very numerous, and concave to the rear.

Soaring only occurred in certain states of the atmosphere—generally when sun was shining—but the weather conditions appeared to vary with locality. When the air was not soarable birds flapped or used ascending currents. When it was soarable they avoided ascending currents like the devil, and sought for descending currents. Soaring flight in a descending current was at a higher speed than other types of flight. The gain of height was more rapid than in a rising current, and the bird would shoot up with its centre line parallel to its line of ascent. In rising currents it flew with body horizontal, and rose relatively slowly.

The evidence was overwhelming that soaring was due to some force quite other than that recognised by aerodynamic experts. He had no doubt whatever that there was a definite propelling force on the wings of soaring birds in flight under suitable conditions, and that this was in some way connected with the transverse ridges. He had made tests on wooden models of "finrays" similar to those of the flying fish wing, by pushing them through the air on a motor car—ahead of the car itself. Monometers had been arranged to measure the pressure on both the leading edge and on the concave rear of these finrays. Contrary to the expectations of the aerodynamicists, he had measured positive pressures at the rear of these finrays—in one or two cases greater than that on the leading edge.

These positive pressures at the rear disappear entirely with slight rain, and otherwise vary with weather conditions. The results generally seem to indicate that this unexpected pressure is directly connected with the possibility of soaring, but the experiments are not yet advanced sufficiently to be conclusive.

He had no theory of any kind. The whole affair was so far inexplicable, and it must rest with the experimenter to solve the problem. He suggested that his hearers could, with the aid of models, more rapidly investigate the question than could any experimenters working with full size machines.

## THE PEGNA-ROSSI-BASTIANELLI SEAPLANE.



The photograph here reproduced shows the large four-engined flying boat built in 1921 by La Compagnia Bastianelli, of Rome, to the designs of Signores Pegna and Rossi.

The machine, which is of nearly 100 feet span, is intended to carry a very large proportion of disposable load at the high cruising speed of 100 m.p.h. It is equipped with four Isotta-Fraschini engines of 270 h.p. each, arranged two in tandem in each of the two wing nacelles. It is obvious from the photograph that the machine has very clean lines, and an air of general seaworthiness. The water clearance allowed the air-screws looks too small for rough water, but

appearances may be deceptive, particularly as the hull is of very considerable cross section.

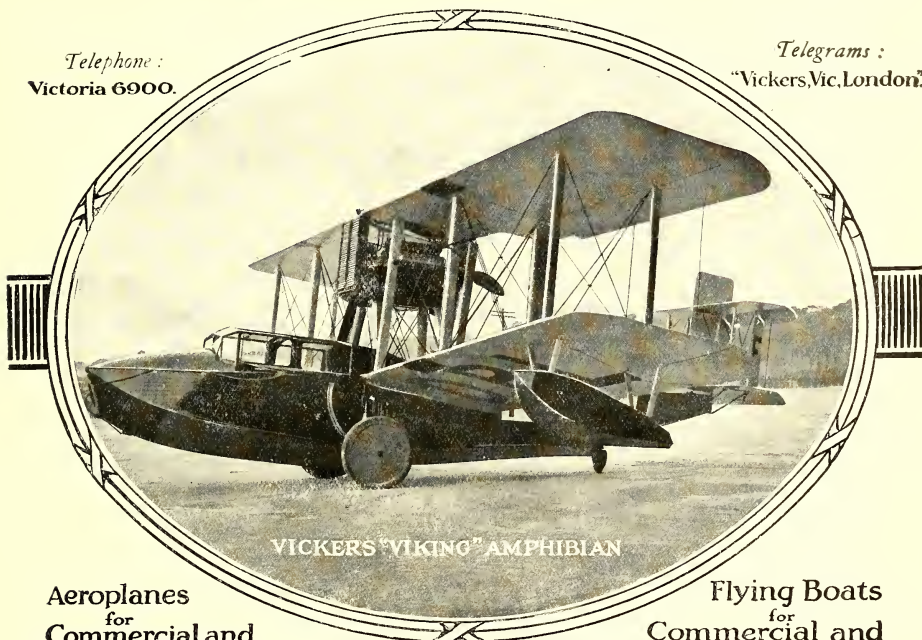
The main dimensions of the machine are given below:—

### SPECIFICATION OF THE P.R.B. FLYING BOAT.

Span .....	30 m.	Weight empty .....	4,400 kg.
Length overall .....	16.5 m.	Weight loaded .....	7,300 kg.
Height overall .....	6.5 m.	Loading per sq. metre .....	
Wing area .....	20,689 m.		35.7 kg.
Engines, 4 Isotta Fraschini		Weight per h.p. ....	6.75 kg.
type V6, 270 h.p. each		Cruising speed .....	16.0 k.p.h.

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2. Fastest time over a given circuit.
3. Climb to 1,000 metres.
4. Altitude with full load.

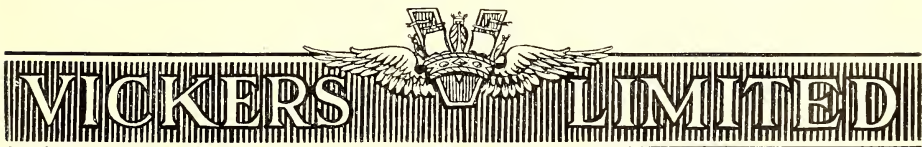
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Buildings, Pilgrim Street.  
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West George Street.  
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HEIGHT: 15' 1"  
LENGTH: 35' 0"

The Vickers "Viking" was the winner of the FIRST prize of £10,000 for the Amphibian Class of Aircraft entered for the BRITISH AIR MINISTRY COMPETITION, September, 1920.



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## PRACTICAL HINTS ON AIRCRAFT INSTRUMENTS.

### NO. 4.—PRESSURE GAUGES.

Practically all aero pressure gauges are of the "Bourdon tube" type, which is extremely simple in construction and operation. It consists of a small metal case, containing a thin, flat, curved tube of springy metal, one end of which is sealed and the other sweated to a small casting which is connected to the oil or petrol system by means of a screwed union. Upon pressure being applied at the union, the "Bourdon tube" will endeavour to straighten out, this movement being transmitted to the pointer by means of a simple link mechanism. The dial is calibrated in lbs. per sq. inch, or if of continental make in kg. per sq. cm.

This type of gauge is at once the most simple and robust gauge it is possible to construct. At the same time it has one of two inherent faults which require careful watching.

The most important point in this direction is the question of overload.

It is a well-known fact that on many aero engines the oil pressure when first starting up from cold is two to three times greater than when running; unless the pressure gauge is designed to stand this overload pressure the Bourdon tube will take a "set" through the strain and the pointer will read about 10 lb. pressure instead of zero when the pressure is off. It is therefore particularly important when installing gauges to find what the maximum pressure in the system is likely to be, and to fit a gauge which is designed to withstand this excess pressure for fairly long periods. The standard gauges for use on aircraft are 100 and 200 lb. per sq. in. for the oil pressure system and 5 and 10 lb. gauges for the petrol system.

In the case of the oil gauges, steps should be taken to find out the overload pressures they are built to withstand.

The air pressure gauges should be carefully selected, mainly on account of the low pressure at which they are required to read. As the whole idea of the air pressure gauge is to indicate to the pilot that the petrol supply is functioning correctly it is most essential that the gauge reads absolutely dead right. This is obvious, when one considers that a variation of half a pound per sq. in. may mean that the petrol supply is maintained efficiently or cut off. A gauge, therefore, with a total error of 1 lb. per sq. in. is quite useless for the purpose for which it was intended.

It is most essential, when installing pressure gauges, to make all joints and connections to the tank, etc., perfectly airtight.

The usual method of testing gauges is to connect them to a compressed air cylinder together with a specially calibrated master gauge. As the air is gradually emitted from the cylinder the readings of the master gauge and the instrument under test are compared and any errors noted.

The amount of air released at any time is controlled by an ordinary cock, placed between the cylinder and both the gauges. It is not always possible to obtain the necessary apparatus for testing, and under these circumstances it is advisable to send doubtful gauges to the makers for examination.

This applies more to gauges used in the petrol system for reasons stated previously; it being particularly essential for them to read accurately from 0—1½ lb. per sq. in. On many gauges one or even two movable lubber marks are provided and it is necessary to have these in the correct position on the scale or not at all. They can be arranged to indicate normal working pressure or to show the minimum and maximum limits of safe working; it is necessary to find out these for the particular engine installation and carefully adjust the lubber marks accordingly.

When ordinary care is taken to install the right gauge, little trouble should ever occur; in fact, these instruments will be found to be the most trouble-free on the instrument board if they are properly looked after.

### A SWISS PAGEANT.

What can be likened unto an Aerial Pageant on a small scale, was held at Geneva on May 31st, by the Swiss Military Flying Corps.

The previous evening there arrived from Dubendorf, near Zurich, 19 military aeroplanes, consisting of 6 Hæfeli D.H.3s (150 h.p. Hispano-Suiza), 6 Zeppelin-Maybach all-metal biplanes, 6 Hanriot single-seater biplanes (110 h.p. Le Rhone), and one Hæfeli, which preceded the whole, flown by Capt. Rihner in command.

On Sunday morning, Major Müller, the O.C. of Dubendorf, arrived on a Hæfeli D.H.5 (200 h.p. Winterthur). At 15.00 hours, a flight of Hæfelis took off and flew round the neighbourhood of Geneva, while the Zeppelin biplanes carried out a bombing attack on the aerodrome. The Hæfelis then joined in the attack on the aerodrome, which was defended by the six Hanriots. After much excellent flying the

machines gradually reformed into their respective flights and landed.

Lieuts. Hæfeli and Primault in Hæfeli D.H.3s then carried out a "vol de précision," the two machines flying together for a space of 15 minutes with their wing-tips not more than 3 metres apart during the whole of the evolutions.

The Hanriot flight then gave an exhibition of formation flying, and finally engaged in acrobatics, to the enjoyment of the huge crowd present.

During the meeting a "Goliath," piloted by M. Labouchère, carried many passengers.

The military machines returned to Dubendorf at 18.00 hours, after a very successful exhibition before a crowd estimated to number 35,000, all of whom were enchanted by the virtuosity of their national air service.—J. J. H. per L. B.

### THE SCHNEIDER CUP.

For the Schneider Cup which will take place in August at Naples eight entries have been received up to May 31st, the final date for entering. These are composed of two French, one English and five Italian machines.

The Italian machines are: two Macchi, two Savoia, of which one is probably the Marchetti-Vickers-Terni biplane on floats, the construction of which has been taken over by the Savoia firm, and one Pegna-Bonmartini-Cerroni, entered by a new firm registered under the above title. This latter society was formed on May 29th in Rome, to construct aircraft to the design of Eng. Pegna, who designed the P.R.B. (Pegna-Rossini-Bastianelli) four-engined flying-boat, which has put up such an excellent performance in Italy.

The French entries are unknown at the moment and the English entry is presumed to be a Supermarine.—A. B.

### A USEFUL AID TO ENGINE TIMING.

The accompanying photograph illustrates a Top Dead Centre Tester which was made during the War for a certain type of aero-engine cylinder for accurately finding the top dead centre position for the operations of valve and ignition timing. The instrument is applied to the cylinder in exactly the same way as inserting an ordinary sparking plug.

The body (a) is very similar to the ordinary sparking plug body, with the exception that it has an extension piece below the threaded portion, providing a longer bearing for the timing rod (b) which is a sliding fit in the diagonally drilled hole in the body.

An air release, not shown in the photograph, is provided in the body (a) by means of a by-pass hole, thus releasing the air on the upward stroke of the piston. The bottom end of the timing rod (b) is in direct contact with the crown of the piston, while the top end is provided with an adjusting piece (c) giving the necessary adjustment to the dial gauge (d) in relation to its vertical limit of movements. It also provides a safeguard from the timing rod dropping into the cylinder.

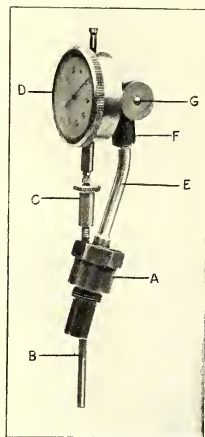
The support rod (e) is screwed into the body and forms a rigid support for the dial gauge (d). At the top of support rod is a lug (f) carrying a pivot pin (g), thus enabling the dial gauge to be swung about its axis, giving accessibility in the taking out or inserting of the timing rod into the body. The lug (f) is taper pinned to the support rod. This Tester was used with success on aero-engine work in France, as it enabled the mechanic to read directly off the dial gauge which is graduated in 1/1,000ths of an inch without making the usual close and scrutinising operation of watching a piece of rod in the cylinder, and marking it when it is at the top dead centre position.

This device is the subject of a patent by Mr. E. J. Kynoch, of 22, Shirley Road, Acoc's Green, Birmingham, to whom enquiries relating to it may be addressed.

### AN ITALIAN FAILURE.

According to the Italian Press, a petition in bankruptcy has been filed by the creditors of the S.A.I.A.M. in the Milan Courts.

It is also stated that the managing director, Comm. Luigi Mapelli, has departed the country.—A. B.



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# COMMERCIAL AERONAUTICS.

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## CONTINENTAL ARRIVALS AND DEPARTURES.

[The following table of arrivals at and departures from the British Air Ports is compiled on the following system:— First comes the initials of the Air Line; next the type of machine; next the international number of the machine; next the ports of departure and destination; next the times of departure and arrival; next the cargo, whether goods (G) and/or mails (M); next the number of passengers; and finally the name of the pilot and number of mechanics, if any.]

ABBREVIATIONS.—A.D.—Aircraft Disposal Co. B.A. Berkshire Aviation Co. B.C.—Bristol Aeroplanes Co. C.A.—Compagnie de Civil Aviation. D.A.—Daimler Airway. D.H.—De Havilland Aircraft Co. G.E.—Compagnie des Grands Express Aériens. H.P.—Holland Transport Ltd. I.L.—Instone Air Line. K.L.—Koninklijke Luchtvaart Maatschappij. L.A.—Letherhead Aviation Services. M.A.—Messageries Aériennes. M.W.—Marconi Wireless Telegraph Co. Ltd. P.O.—Privately owned. P.L.—Peters Ltd. S.F.—Surrey Flying Services. S.N.—Syndicat National pour l'Etude des Transports Aériens (S.N.E.T.A.).

The London Terminal Aerodrome, Croydon. (Telephone: Croydon 2720.)

### JUNE 5th:

M.A., Breguet, F-CMAK, London-Paris, 05.08-07.55, G, Nil, Delage.  
I.L., DH34, G-EBBR, London-Paris, 11.35-13.55, G, 2, Shepperson.  
M.A., Breguet, F-ADAU, London-Paris, 11.40-14.30, G, Nil, Ferguson.  
D.H., DH5, G-EAYU, London-Strasbourg, 11.55-1, Nil, Nil, Cobham.  
H.P., W8, G-EBBB, London-Paris, 12.06-14.50, G, 2, Olley & 1.  
M.A., Sead, F-ADAY, London-Paris, 11.00-13.30, Nil, Nil, Rolyu.  
C.E., Goliath, F-ADDT, London-Paris, 14.00-16.45, G, 2, Favre & 1.  
D.A., DH34, G-EBBS, London-Paris, 14.30-16.40, Nil, 1, Herne & 1.  
I.L., Westland, G-EARF, London-Paris, 14.40-18.05, Nil, Nil, Courtney.  
M.A., Breguet, F-CMAK, Paris-London, 05.10-07.50, Nil, Briere.  
I.L., Vnlan, G-EBBI, Brussels-London, 11.40-14.00, Nil, 2, Barnard.  
H.P., DH18, G-EAWX, Paris-London, 11.50-14.17, Nil, 5, Rogers.  
M.A., Goliath, F-ADAY, Paris-Ldn, 15.05-17.15, G, 2, Charpentier & 1.  
C.E., Goliath, F-GEAC, Paris-London, 14.57-17.00, Nil, 4, Grassett & 1.  
I.L., DH34, G-EBBR, London-Paris, 15.50-18.05, G, 2, Shepperson.  
D.A., DH34, G-EBBS, Paris-London, 17.15-19.21, Nil, 4, Herne & 1.

### JUNE 6th:

M.A., Breguet, F-CMAK, London-Paris, 05.20-07.57, G, Nil, Briere.  
I.L., DH34, G-EBBR, London-Paris, 05.21-08.04, G, Nil, Jones.  
D.A., DH34, G-EBBS, London-Paris, 08.23-11.00, M, 1, Robertson & 1.  
K.L., Fokker, H-NABD, London-Adm, 10.00-13.07, G, M, Nil, Sillins.  
I.L., DH34, G-EBTT, London-Paris, 11.00-14.10, G, M, 2, Robins.  
H.P., DH18, G-EAWX, London-Paris, 13.15-16.00, G, M, 1, Carter.  
M.A., Goliath, F-ADAY, London-Paris, 13.17-17.05, G, 2, Charpentier & 1.  
K.L., Fokker, H-NABS, Ldn-Adm, 13.57-17.00, G, M, Nil, Geyssendorfer.  
C.E., Goliath, F-GEAC, London-Paris, 14.00-17.40, G, 1, Grassett & 1.  
D.A., DH34, G-EBBS, London-Paris, 14.35-17.08, M, 1, Herne & 1.  
I.L., DH34, G-EBBR, London-Brussels, 16.10-18.12, G, M, Nil, Holmes.  
M.A., Breguet, F-CMAK, Paris-London, 05.05-07.50, G, M, Nil, Delage.  
K.L., Fokker, H-NABH, Adm-London, 11.02-13.53, G, M, Nil, Hofstra.  
I.L., DH34, G-EBBR, Paris-London, 11.23-13.46, G, 4, Jones.  
D.A., DH34, G-EBBS, Paris-London, 11.55-14.15, Nil, 4, Hinchliffe & 1.  
H.P., W8, G-EBBB, Paris-London, 12.08-14.35, G, 3, Olley.  
M.A., Goliath, F-AEBY, Paris-Ldn, 13.35-16.23, G, M, 1, Le Men & 1.  
K.L., Fokker, H-NAB, R'dm-London, 14.21-16.49, G, M, 3, Scholten.  
C.E., Goliath, F-ADDT, Paris-London, 15.00-17.46, G, Nil, Gastoux & 1.  
I.L., DH34, G-EBBR, Paris-London, 16.57-18.45, G, 3, Robins.  
I.L., Westland, G-EARF, Brussels-London, 16.50-18.5, G, 2, Courtney.  
D.A., DH34, G-EBBS, Paris-London, 17.50-20.04, Nil, 2, Robertson & 1.

### JUNE 7th:

M.A., Breguet, F-CMAK, London-Paris, 05.16-08.05, G, Nil, Delage.  
I.L., DH34, G-EBTT, London-Paris, 05.32-08.11, G, 1, Brady.  
D.A., DH34, G-EBBS, London-Paris, 08.30-11.00, M, Nil, Herne.  
K.L., Fokker, H-NABH, London-Adm, 10.00-13.12, G, M, 1, Hofstra.  
H.P., W8, G-EBBB, London-Paris, 12.17-15.00, G, M, 2, McIntosh & 1.  
M.A., Goliath, F-ADAY, London-Paris, 13.05-16.12, G, 2, Le Men & 1.  
K.L., Fokker, H-NAB, London-Adm, 13.57-17.00, G, M, Nil, Scholten.  
C.E., Goliath, F-ADDT, London-Paris, 14.05-17.00, G, 2, Gastoux & 1.  
D.A., DH34, G-EBBS, London-Paris, 14.24-17.00, M, 2, Robinson.  
I.L., Westland, G-EARF, London-Paris, 15.20-18.50, G, 2, Barnard.  
I.L., DH34, G-EBTT, London-Paris, 16.20-19.00, M, 5, Powell.  
M.A., Breguet, F-ADAI, Paris-London, 05.16-08.00, G, M, Nil, Paillet.  
K.L., Fokker, H-NAB, R'dm-London, 11.02-13.15, G, M, 1, Pyt.  
D.A., DH34, G-EBBS, Paris-London, 11.55-14.15, G, 2, Barnard.  
I.L., DH34, G-EBTT, Paris-London, 11.26-13.44, G, Nil, Brady.  
I.L., DH34, G-EBTT, Brussels-London, 11.48-15.53, Nil, 2, Holmes.  
K.L., Fokker, H-NAB, R'dm-London, 12.57-15.45, G, M, 1, Sillins.  
M.A., Goliath, F-THMF, Paris-London, 13.28-16.20, G, M, 1, Pettit & 1.  
C.E., Goliath, F-GEAO, Paris-London, 14.25-17.07, G, 3, Rissier & 1.  
H.P., DH18, G-EAWX, R'dm-London, 15.00-17.50, G, 3, Carter.  
D.A., DH34, G-EBBS, Paris-London, 17.30-19.48, G, 2, Robinson.  
C.E., Goliath, F-ADDS, Paris-London, 22.02-11.12, Nil, 6, Labouchere & 1.

### JUNE 8th:

G.E., Goliath, F-ADDS, Paris-London, 05.50-08.05, Nil, 6, Labouchere & 1.  
I.L., DH34, G-EBBR, London-Paris, 05.24-08.30, G, Nil, Jones.  
M.A., Breguet, F-ADAI, London-Paris, 05.24-09.00, G, Nil, Paillet.

D.A., DH34, G-EBBS, London-Paris, 08.40-11.15, G, M, 1, Robertson.  
K.L., Fokker, H-NABH, London-Adm, 09.57-13.02, G, M, Nil, Pyt.  
I.L., W8, G-EBBB, London-Paris, 10.14-13.53, G, M, 2, Wilcockson & 1.  
H.P., W8, G-EBBB, London-Paris, 12.35-15.35, G, M, 2, Rogers & 1.  
M.A., Goliath, F-THMF, London-Paris, 13.18-17.00, G, 1, Pettit & 1.  
C.E., Goliath, F-GEAO, London-Paris, 14.15-19.00, G, M, Nil, Rissier & 1.  
K.L., Fokker, H-NAB, London-Adm, 14.15-17.00, G, M, 2, Sillins.  
D.A., DH34, G-EBBS, London-Paris, 14.55-17.31, M, 1, Hinchliffe.  
D.H., DH16, G-EBAN, London-Paris, 14.22-17.31, Nil, 1, Wilson.  
I.L., DH34, G-EBTT, Ldn-Brussels, 16.00-19.18, G, M, 2, Shepperson.  
M.A., Breguet, F-CMAK, Paris-London, 06.00-08.35, G, M, Nil, Donlin.  
K.L., Fokker, H-NABH, Adm-London, 11.54-14.13, G, M, Nil, Hofstra.  
I.L., Westland, G-EARF, Paris-London, 11.55-14.14, G, 2, Barnard.  
D.A., DH34, G-EBBS, Paris-London, 11.59-14.07, Nil, 2, Hinchliffe.  
H.P., W8, G-EBBB, Paris-London, 12.35-14.40, G, 4, McIntosh & 1.  
I.L., DH34, G-EBTT, Brussels-London, 12.15-14.20, Nil, Nil, Powell.  
M.A., Goliath, F-ADAY, Paris-Ldn, 13.40-16.53, G, M, 2, Challoux & 1.  
K.L., Fokker, H-NABO, R'dm-London, 14.12-16.54, G, M, 1, Smirnoff.  
C.E., Goliath, F-GEAC, Paris-London, 14.35-17.12, G, Nil, Favre & 1.  
I.L., DH34, G-EBBR, Paris-London, 16.05-18.40, G, M, Nil, Jones.  
H.P., W8, G-EBBB, Paris-London, 17.40-20.07, Nil, 5, Rogers & 1.  
D.A., DH34, G-EBBS, Paris-London, 18.00-20.02, Nil, 1, Robertson.

### JUNE 9th:

I.L., DH34, G-EBBR, London-Paris, 08.55-12.30, G, Nil, Robins.  
K.L., Fokker, H-NABH, London-Adm, 11.52-14.56, G, M, Nil, Hofstra.  
I.L., Westland, G-EARF, London-Paris, 12.50-15.05, G, 3, Courtney.  
H.P., W8, G-EBBB, London-Paris, 12.40-15.45, G, M, 2, Olley & 1.  
M.A., Goliath, F-ADAY, London-Paris, 13.07-15.53, G, Nil, Challoux & 1.  
K.L., Fokker, H-NABQ, London-Adm, 14.00-16.30, G, M, 1, Smirnoff.  
I.L., DH34, G-EBTT, London-Paris, 14.30-16.50, G, M, 2, Shepperson.  
D.A., DH34, G-EBBS, London-Paris, 14.30-16.50, M, 2, Herne.  
I.L., DH34, G-EBTT, London-Brussels, 17.20-19.40, G, M, 2, Holmes.  
K.L., Fokker, H-NAB, Paris-London, 16.35-19.10, Nil, 1, Wilson.  
I.L., DH34, G-EBTT, Brussels-London, 16.30-18.41, G, 2, Shepperson.  
K.L., Fokker, H-NABK, Adm-Ldn, 14.28-17.34, G, M, 4, Van der Hoop.  
M.A., Goliath, F-AEBY, Paris-Ldn, 14.40-17.05, G, M, Nil, Le Men & 1.  
I.L., DH34, G-EBBR, Paris-London, 14.16-16.13, G, M, Nil, Robins.  
K.L., Fokker, H-NABG, R'dm-Ldn, 14.45-17.25, G, M, Nil, Warran.  
C.E., Goliath, F-GEAO, Paris-London, 15.00-17.54, G, 2, Grassett & 1.  
H.P., W8, G-EBBB, Paris-London, 15.05-17.43, G, 4, Wilcockson.  
I.L., Westland, G-EARF, Paris-London, 16.24-18.55, G, 2, Courtney.  
D.A., DH34, G-EBBS, Paris-London, 17.25-19.50, Nil, Nil, Herne.

### JUNE 10th:

M.A., Breguet, F-CMAK, London-Paris, 05.30-07.50, G, Nil, Donlin.  
I.L., DH34, G-EBBR, London-Paris, 06.33-08.40, G, M, Nil, Brady.  
D.A., DH34, G-EBBS, London-Paris, 08.30-10.41, M, Nil, Robinson.  
K.L., Fokker, H-NAB, Ldn-Adm, 11.00-13.12, G, M, Nil, Warran.  
I.L., Vnlan, G-EBBI, London-Paris, 11.40-13.58, Nil, 7, Powell.  
H.P., W8, G-EBBB, London-Paris, 12.15-15.35, G, M, 2, McIntosh & 1.  
M.A., Goliath, F-AEBY, London-Paris, 13.15-15.53, G, Nil, Le Men & 1.  
C.E., Goliath, F-GEAO, London-Paris, 14.15-18.20, G, 1, Grassett & 1.  
D.A., DH34, G-EBBS, London-Paris, 15.00-17.43, G, M, Nil, Robertson.  
I.L., Westland, G-EARF, London-Paris, 16.20-18.50, G, 2, Barnard.  
M.A., Breguet, F-CMAK, Paris-London, 05.50-08.05, G, M, 1, Portal.  
D.A., DH34, G-EBBS, Paris-London, 11.33-14.17, Nil, 5, Robinson.  
I.L., DH34, G-EBTT, Paris-London, 11.55-14.15, G, 2, Barnard.  
K.L., Fokker, H-NABO, R'dm-Ldn, 14.27-17.25, G, M, 1, Smirnoff.  
H.P., W8, G-EBBB, Paris-London, 12.00-15.17, G, 4, Olley.  
I.L., DH34, G-EBTT, Brussels-London, 12.20-13.40/17th, G, Nil, Holmes.  
K.L., Fokker, H-NAB, R'dm-Ldn, 13.57-15.45, G, M, Nil, Dorr & 1.  
C.E., Goliath, F-ADDT, Paris-Ldn, 14.45-18.22/11th, G, Nil, Gastoux & 1.  
I.L., Vnlan, G-EBBI, London-Paris, 16.00-19.04, G, Nil, Powell.  
D.A., DH34, G-EBBS, Paris-London, 18.10-20.58, Nil, 1, Robertson.

### JUNE 11th:

H.P., DH18, G-EAWX, London-Paris, 08.25-10.30, Nil, 4, Rogers.  
H.P., W8, G-EBBB, London-Paris, 10.02-12.15, G, 3, Foot & 1.  
I.L., Vnlan, G-EBBI, London-Paris, 11.52-13.53, G, M, 6, Shepperson.  
M.A., Breguet, F-CMAK, London-Paris, 12.50-14.55, Nil, 1, Portal.

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I.L., DH.34, G-EBBT, London-Brussels, 15.59-18.11, Nil, 4, Robins.  
 M.A., Brequet, F-AMAD, Paris-London, 06.50-8.1, Ing., G., Nil, Brice.  
 M.A., Spad, F-ADMC, Paris-London, 13.05-16.28, Nil, Nil, Revie.  
 I.L., Vulcan, G-EBBL, Paris-London, 16.05-18.54, Nil, 7, Shepperson.  
 H.P., W.S., G-EBBH, Paris-London, 17.00-19.51, G., 8, McIntosh & 1.  
 H.P., DH.18, G-EAWX, Paris-London, 18.00-20.55, Nil, 4, Rogers.

### Inland Flying at Croydon.

June 5th.—S.F., Avro, joy-rides (Muir); D.H., D.Ho, from Stag Lane (Cobham).  
 June 6th.—S.F., Avro, joy-rides (Muir); B.C., Bristol Ballet to Bristol (Uwins).  
 June 7th.—H.P., W.S. tests (H.P. Pilots); S.F., Avro, joy-rides (Muir).  
 June 8th.—S.F., Avro, joy-rides (Muir).  
 June 9th.—M.W., Avro, tests (Saw); I.L., Vulcan, tests (Instone Pilots); B.A.C., Bristol, Bristol return (Uwins); H.P., W.S. tests (H.P. Pilots); G.A.C., Ramel to Martlesham (James).  
 June 10th.—S.F., Avro, joy-rides (Muir); H.P., W.S. tests (H.P. Pilots).  
 June 11th.—S.F., Avro, joy-rides (Muir).

### Flying by the Aircraft Disposal Co.

June 4th.—6th—Nil.  
 June 7th.—2 D.H.9s, tests (Stocken).  
 June 8th.—2 D.H.9s, tests (Stocken); D.H.9, tests (Muir); Avro, G-EBDC, left for Brussels (Hayns).  
 June 9th.—2 D.H.9s, test (Muir); D.H.9, test (Stocken).  
 June 10th.—3 D.H.9s, 354, 9347, 5755, test (Stocken).

### Cross-Channel Statistics.

Week ending June 11th:—  
 Machines, 134; Passengers, 258; Crews, 175; Total Personnel, 433.  
 Corresponding week last year:—  
 Machines, 97; Passengers, 299; Crews, 111; Total Personnel, 410.  
 Corresponding week, 1921:—  
 Machines, 93; Passengers, 188; Crews, 107; Total Personnel, 295.

### The London Terminal Aerodrome.

On Wednesday Capt. Stocken, for the Aircraft Disposal Company was testing some D.H.9s for the Rumanian Government. The following day he put another one through and Mr. Muir took two more. Mr. Hayns left for Brussels on an Avro.

On Friday Capt. Stocken and Mr. Muir were doing height tests on more Rumanian D.H.9s, disappearing from view up into the sky. Capt. Stocken completed tests of three more D.H.9s on Saturday morning.

The Daimler Airway are still keeping up their twice daily service with G-EBBS. The engine and machine are both as good as new and suffer in no way from their hard work. When one travelled to Paris and back on the machine on Wednesday and Thursday the Napier engine was running without any signs of vibration.

On Saturday evening, when the Instone D.H.34 was being taxed down to its shed, it suddenly swung round into the Daimler Airway engine testing shop. It is not known whether the machine was making a personal call on the Daimler people to know the secret of running five trips a day, or whether it was trying to sting the shed by way of adding a protest to the series of articles on the danger of civil aviation which has been so prominent in the uninitiated Press of late and thus augmenting its master's voice.

Mr. Barnard brought the "Vulcan" over from Brooklands on Friday, and thereafter all the I.A.L. pilots took it up in turn. All were delighted at its manoeuvrability and low landing speed.

Mr. Shepperson took it to Paris on Saturday and returned on Sunday evening with seven passengers, each of whom brought much excess baggage. The machine took off well in Paris and made an absolutely slow landing at Croydon.

Soon after him, Mr. McIntosh brought in Mr. Ponsonby and the W.8b with a large collection of passengers. He made a very quick trip up from Lympne. Later on Mr. Rogers, on the D.H.18, arrived, both machines having a selection of jockeys and racing people who had gone over in the morning to see the French Derby.

On Wednesday a professional dancer went over in a W.8b. On arrival in Paris she asked Mr. Ponsonby if the machine was fitted with Liberty motors. "No," replied Mr. Ponsonby promptly. "We do not take Liberties in our machines."

Handley Page Transport have handed back the Bristol-Napier machine to the Air Ministry as they now have sufficient machines of their own. It is understood that on the arrival of the Napier W.8 this week they will also hand back the D.H.18.

The Instone Air Line have taken over the Bristol and will in all probability receive the D.H.18 as well.

Major Foot and Messrs. Carter and Dismore have been flying the W.8b during the week, and all have made perfect landings. On Friday, Mr. McIntosh took the penultimate O/400 G-EATK to Cricklewood, where she will be kept as a stand-by machine. The Handley-Page hangar at Croydon is now full to overflowing.

Mr. "Jimmy" James, of the Gloucestershire Aircraft Company's "Bamel," left for Martlesham on Friday, with his suit-case securely fixed on the undercarriage. He had

two forced landings on the way owing to weather, one of which was near Southend-on-Sea. An officer of the R.A.F. was to fly the Bamel this week in order that he may make a report as to the machine's value as a fighting scout.

"Better late than never" as the soldier said!  
 The K.L.M. people are having a fair load of goods and quite a few passengers lately on the Fokker, and in spite of them running a twice-daily service they have had to duplicate some of these on occasion. The F.III fitted with "Eagle VIII" Rolls-Royce will arrive shortly.

Mr. Muir has had a fair number of joy riders, only he suffers from a falling-off of numbers in the same way as do the air line people. He has a Renault Avro three-seater now ready which will be used for joy riding.

M. Labouchère came over from Paris by night on a "Goliath" on Wednesday night, and returned in the early morning before dawn. There was much merry-making at the aerodrome to celebrate the arrival.

The previous Thursday, Sir Sefton Branker made the trip on a Handley Page belonging to the R.A.F. Both machines reported favourably on the lighting of the route, though why anyone wants to fly by night to Paris one fails to see, as no goods or passengers should want to be delivered at night, and if they want to travel by night there is an excellent night boat and train in which they can confine travelling and their night's sleep.

Messrs. Biddlecombe and Curtis, who are, so to speak, the children of darkness, seeing that they look after the lights and inspect them, were present. Doubtless their experiments with these lights on the Continental route will be of great value when they start lighting trans-Continental routes, over which night flying will be of vast importance.

News comes from Mr. Perry in Rumania. He states that the arrival and departure statistics for Rumania for the past several weeks have been nil.

Mr. Hinkler came in from Southampton in a 504K Avro on Sunday to dispatch spores for a "Baby" Avro that had forced-landed in Holland en route for Russia.—G. D.

### Co-Optimism.

On a recent visit to a certain theatre in Paris, one came across a remarkably good sketch. This was repeated on once to Mr. Clifford Whitley, one of the three directors of the Co-optimists, and late of 21 Squadron, R.A.F.

Mr. Whitley and oneself therefore travelled per Daimler Airway to Paris on Wednesday, and returned, complete with sketch, on Thursday. We went over in D.H.34 G-EBBS, with Napier engine, piloted by Mr. Robinson, in 2½ hours, and returned in the same machine piloted by Mr. Hinchliffe, the following day, in 2 hours.

On the return trip we met numerous thunderstorms in the Channel, and had to make the short crossing from Boulogne to Hythe, though on the outward trip we took the more useful Dungeness—Baples route.

Incidentally, the Co-optimists are a company very closely allied to the R.A.F., because the three directors, Mr. Clifford Whitley, Mr. A. de Bear, and Mr. "Laddie Cliff" (Clifford Perry), were all erstwhile officers of the R.A.F., as also is Mr. Stanley Holloway.

As an entirely new programme is being put on next Monday, and the show does not begin until 21.15 hrs., it is certain that the Palace will be a popular rendezvous after the Pageant on June 24th.—G. D.

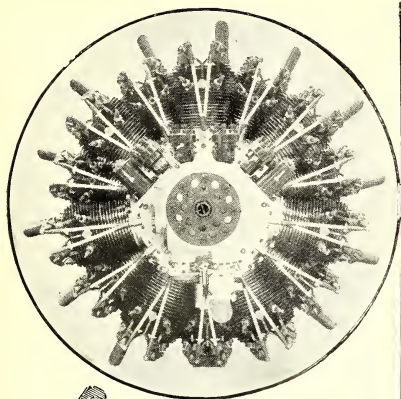
### Co-Pessimism.

The amount of hot air that has been expended in the newspapers on the subject of commercial aviation would in itself be sufficient to equip with lifting material for a considerable period the entire fleet of airships possessed by Great Britain and might there be more usefully employed. And the really enlightening part of the whole episode is the fact that the majority of correspondents either never go near a commercial aerodrome at all or at most they make such a visit a dozen times a year, and most of those dozen times are special days when commercial flying, in an endeavour to look its best, becomes disorganised.

I have known Croydon aerodrome since its inception. I have watched the evolution of firms, pilots, machines, organisation, wireless, etc., from an entirely disinterested point of view. I have at some time or another quarrelled with most people on the aerodrome, and as a spectator I see and hear from an impartial point of view business and personal quarrels and differences between others.

I have watched all machines and all pilots landing and taking off, well on some occasions and badly on others. I am a terrible coward in the presence of danger and yet I say without hesitation that there is no single pilot, machine or engine employed or owned by any British firm now in operation at Croydon with whom I would not travel to Paris or Brussels in any weather in which flying is deemed advisable.

It is only the few people who have had trouble on the air lines who bother to write to the papers. Those who are



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satisfied, and they are in the vast majority, as anyone who attends Croydon regularly can see for him- or herself, do not so waste their time, and so space has been filled by the confirmed grouser who is only too eager to lodge a complaint and would not be happy unless he were so doing.

If flying in present time machines and engines, with the pilots employed, were in any way more dangerous than sitting in the present day railway train with the modern driver, I should not fly. There are many occasions on which I hesitate to ride in certain motor cars and with certain drivers.

The reason that the public do not support the air lines is that they lost confidence in flying after the collision and the accident to Sir Ross Smith, and no air line has yet undertaken a proper publicity campaign to restore confidence. Until they do, they will naturally not get the traffic. No one ever got business by sitting down and waiting for it to come.

Things were slowly becoming less bad until the accident to the Spad the other day. I note that the Air Ministry are conducting a special enquiry into the matter and I should not be surprised if they come to a remarkable conclusion. One does not get sunstroke when clouds are covering the sun, and the Spad is too well designed to get out of control and not become uncontrollable again in 2,000 ft., and Mr. Morin was too steady a pilot to lose his head in the ordinary course of events.

However, it is hoped that the result of the enquiry will restore confidence in all machines and companies, both British and foreign.

If the confirmed grouser must use up ink and paper, let him turn to a useful sphere and enquire why the R.A.F. is not being equipped with modern machines and engines. When civil aviation was unable to get new machines, engines, organisation, etc., the chief resigned and an improvement in material resulted. Perhaps a similar change on the political side might also be beneficial. You never can tell—G. D.

[N.B.—The foregoing are, of course, G. D.'s personal opinions. One's own opinions have been expressed in this paper and in the *Times*. Briefly they are that when we have machines which can fly slowly and land on any ground without turning over, and when we have proper directional wireless and ground control and when passengers are carried at railway rates, then, and not till then, civil aviation may reasonably hope for success.—C. C. G.]

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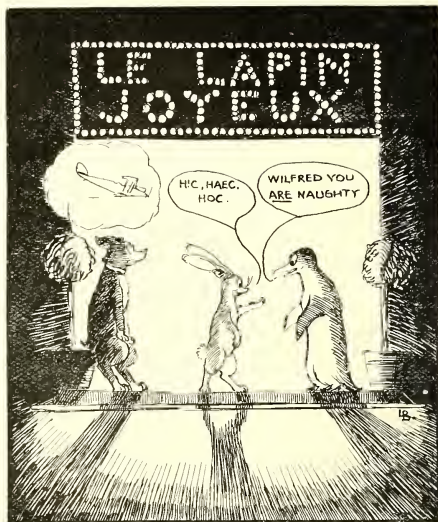
On Monday and Tuesday last week, Mr. Phillips gave demonstrations of stunt-flying and parachute drops here. At the last moment, the machine he was to use was not available, so he at once got onto Mr. Chapman, of the Leatherhead Aviation Services, who put an Avro at his disposal.

Mr. Brock made a descent and Mr. Phillips did some excellent exhibition flying. The "Guardian Angel" parachute worked without a hitch and one drop was made from about 300 ft.

On Monday evening the undercarriage was damaged, and Mr. Chapman at once sent a second machine.

Mr. Phillips states that both machines were perfect in every way, and he has never flown better rigged or better kept machines, and advises anyone who wants to hire a machine, to get in touch with Mr. Chapman.

### THE ADVENTURES OF MAC, BROOME AND WILFRED-IV.



(With Compliments to the Daily Mirror.)

MY DEAR PILOTS AND GROUND WALLARS.—

Once again the pets are at Marseilles. Wilfred had a lovely time in Paris, and now they are enjoying themselves so much and are having nice clothes sent out to them, so they evidently expect to be at Marseilles for a long time. I cannot quite tell you how many times round the World they have been, but as it is three weeks since they left Croydon you can imagine that they must have been at least once, 'cos it would not take world-fliers all that time just to go from London to Marseilles.

Probably they are making their home at Marseilles because the Mediterranean is a nice big landmark and they can count it each time they pass, and so know the number of times they have been round the World.

Anyhow, as I said in the beginning, I say now and probably ever shall say, we will leave them at Marseilles, where they probably still will be next week unless they scurry home incognito.

Your affectionate Uncle.—G. D.

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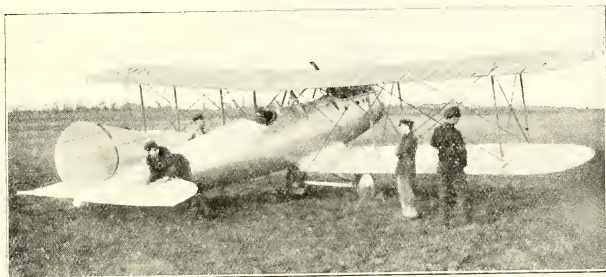
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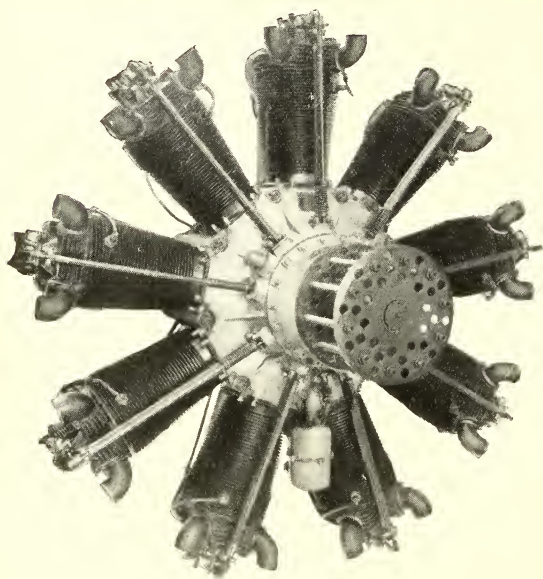
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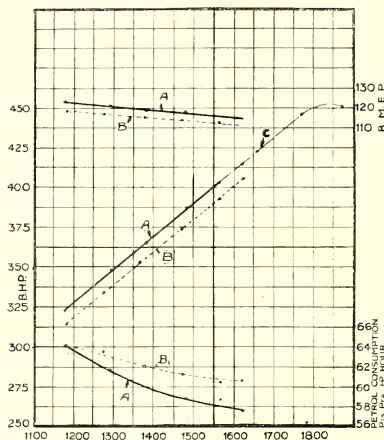
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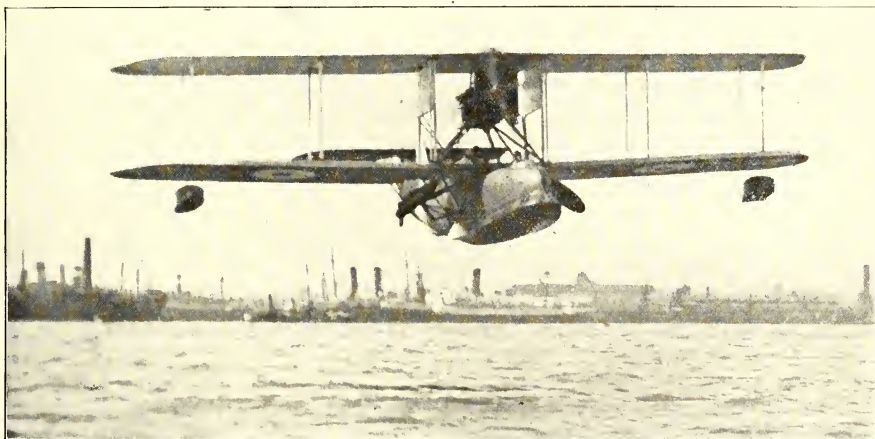
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## ON THE INDEPENDENT FORCE R.A.F.

On Monday night, June 19th, officers of the Independent Force, R.A.F., held their fourth Annual Dinner at the Hotel Cecil. Air Chief Marshal Sir Hugh Trenchard, Bart., K.C.B., D.S.O., A.D.C., occupied the Chair, supported by Group Captain H.R.H. the Duke of York, K.G., G.C.V.O.

### The Secretary of State.

After the toasts of the King and the President of the French Republic had been duly honoured, Captain the Right Honourable F. E. Guest, C.B.E., D.S.O., M.P., Secretary of State for Air, proposed the toast of the guest of the evening, General de Castelnaud, whom he called the Godfather of the Independent Force. He said that many of those present regretted that the Armistice came as soon as it did, and he believed that there was not an officer present, whether still serving or not, who had not got the welfare of the Service at heart.

He congratulated the Chief of the Air Staff on being the first Air Chief Marshal, thus indicating the promotion of the Royal Air Force itself. Captain Guest said that he could foresee a great committee of the three Services with the Chief of the Air Staff in the Chair. As to the R.A.F. itself, in spite of the Geddes Axe, the expansion of the Force would not be hindered when expansion was necessary.

He had accepted on Mr. Churchill's behalf the control of Iraq, and he was sure that those present would approve a message being sent to Sir John Salmond wishing him good fortune in his new command. Also he would like to congratulate Air Vice-Marshal Higgins on his new appointment to the Inland Area. The R.A.F. was now responsible for Home Defence, and it would certainly rise to the occasion. (One only hopes that when the time arrives the R.A.F. will have the machines on which it will be able to rise not only to the occasion but to the enemy's altitude.) The R.A.F. had done equally well in India, Aden, on the Desert Route and in Ireland. People were beginning to appreciate that the Air Force was not only efficient but economical. The country owed a great debt to Mr. Churchill, as father of the Air Service.

Turning to the discussion on Civil Aviation, Capt. Guest asked the public not to accept false criticisms. There was no analogy between Civil Aviation and the Mercantile Marine. Quoting Mr. Churchill, he said that Civil Aviation must fly by itself sooner or later. The interim period between the sooner and the later was a question in which we were concerned at present and the temporary assistance given by the Government during its infancy was only justified up to a certain point. The Government support was in fact no small contribution.

He recalled that Government support included: (1) a direct payment of £3 per head per passenger that they carry; (2) machines on a hire-purchase system at a total cost of three-quarters of their value; (3) change of machines at the companies' will; (4) meteorological services free; (5) use of aerodromes and sheds at a nominal charge; (6) wireless and communication facilities gratis; (7) lighting services for night-flying purposes; and (8) benefits of inspection and research.

In spite of that he understood that none of the air lines paid. It was said that this failure was due to competition and that the problem could be solved by granting a monopoly. No commercial enterprise could be built up by monopoly. Every successful industry had been built up by healthy competition. (At this point one of one's neighbours suggested that the Secretary of State must have been reading THE AEROPLANE. One would not take to THE AEROPLANE the credit of having in any way influenced the views of the Secretary of State, but one is certainly very pleased to see that his views coincide so closely with those expressed in this paper.)

Continuing, Capt. Guest said that the duty of the Government was to assist Civil Aviation and not to interfere with it. As for his personal views he thought that they might be considered depressing but he did not think that the prospect of Civil Aviation in the British Isles was hopeful, firstly

because of our railway system, which was the most perfect in the world, and secondly because of our fitful climate. But the British Isles were not the end of the British Empire, and commercial successes could be made of aviation overseas. (On this point one disagrees with Capt. Guest. One believes that when the aircraft manufacturers can afford to build experimental commercial aeroplanes they will produce machines which can be run at a profit for ordinary hackney carriage work in this country at costs even lower than those of a motor-car. In fact the De Havilland Company are already running obsolete war machines as a commercial proposition.)

Capt. Guest said that he firmly believed that the cross-Channel Services should be maintained even if necessary by higher subsidies. He appealed to the Press to pay more attention to figures which indicated the safety and efficiency of flying and less attention to occasional fatal accidents. He then proposed the health of General de Castelnaud.

### The Marquis de Castelnaud.

General the Marquis de Castelnaud replied to the toast in a speech which was an outstanding example of the exquisite literary qualities inherent in the French language. It may be well to point out that General de Castelnaud is one of the leading Royalists and Roman Catholics in France and is the exemplar of all that was best in the old French nobility. His great ability as a soldier may be gauged by the fact that he was definitely offered the post of Generalissimo, afterwards occupied by General Foch, but refused it on the grounds that he was too old for such work and preferred a more active command. From this it is possible to gauge the high compliment paid to the Independent Force by General de Castelnaud's presence.

In his speech he spoke of the respectful and unalterable feelings of devotion which have been harboured in France for so long towards the glorious dynasty which directs the destiny of the British Empire. The French people were profoundly touched by the delicate tokens of sympathy which the Sovereigns of this country have always shown towards France, and he begged His Royal Highness the Duke of York to convey these feelings to their Majesties.

He was specially touched by the graceful tribute paid by Sir Hugh Trenchard to the President of the French Republic. He expressed his thanks to his dear friend the Maréchal Trenchard who enabled him to be there that night in company with his Royal Highness the Duke of York whose youth, amiability and charm left behind them unforgettable memories in France; to be present in company also with so distinguished and remarkable a guest as Mr. Winston Churchill, whose name is synonymous in France with intelligence, initiative, daring and courage. He reminded Mr. Churchill of their first meeting in France under the grey skies of the Somme, when his presence in the French lines raised the hopes of all. He was glad to be in company also with the Minister of Air who was dealing so vigorously and so intelligently with the problems which beset the new weapon.

He said:—"To thank you I should like to possess a voice of gold, but my voice, alas, is made of the coarser metal of disused war weapons." (Loud cries of "No" from those who understood French.) He referred to the conferences between him and General Trenchard at Autigny-la-Tour and remarked that the austerity of these conversations was tempered by the humour and the wonderfully cultivated alertness of his friend Maurice Barrag.

Referring to the Air War, he said that the frontier was no longer to-day the Rhine or the Vosges or the sea; it was a vertical plane which tended to reach the infinite, the infinite being limited for the present by the ceiling reached by intrepid aviators.

Finally, he said:—"It is inspired by sentiments of profound gratitude that after begging the Duke of York to accept my respectful devotion, I lift my glass in honour of the Ministers, the Air Marshal and the comrades who surround

me and drink to the prosperity and glory of the Royal Air Force of the British Empire which is united to my country by ties of cordial friendship in the present and shall be thus united in the most distant future.

### The Chief of the Air Staff.

Sir Hugh Trenchard, proposing the Independent Force, asked how he could be expected to speak after General de Castelnau and Capt. Guest, and before such a great speaker as Mr. Churchill. However, he now proposed the toast of the Independent Force for the fourth time in succession. He sometimes thought that it would be well if the toast were proposed by someone else who helped to form the Force, but for the present he was glad to see how keen all present, including the Duke of York, were that this Dinner Club should continue and that more and more members should be present year by year. This year there were more members present than last year, thanks to the untiring efforts of Major "Toe" Smith, Squadron Leader Cleverly, Group Captain Newall and Captain Marson.

Since they last met the discussions of the past were happily over. The R.A.F. was now made after three years. It might be small, but it was made, and those who had left the R.A.F. had helped to make it. They had all been pleased to read Mr. Chamberlain's speech in the House of Commons last March. When he was coming out of the House after that speech, one of the House of Commons' policemen said "I am glad for the Air Force." That, he suggested, represented public opinion.

The Chief of the Imperial General Staff, Lord Cavan, said at the Academy Banquet recently that it was the wish of the Army Council to help the R.A.F. in every way. He thanked the C.I.G.S. for the help that had been given to the R.A.F. and he knew that help would continue. Though they were still discussing methods of co-operation with the Navy, he felt sure that they could rely on their help also.

Turning to the work of the past twelve months, he said that the R.A.F. had been successful in maintaining peace in Trans-Jordania. He mentioned the case of two tribes which were always fighting in that area. A conference was called between the chiefs of the tribes in the presence of one of our political officers. Two aeroplanes flew overhead during the conference—there were only four in the area, and one was out of action—and peace was signed between the tribes the same day.

Iraq was now in process of being transferred to the R.A.F., and all accounts told of the wonderful things done by the Air Force in that country. The late Sir Walter Raleigh had, only a few days before his death, told him (Sir Hugh Trenchard) how cheery the R.A.F. were in Iraq under Group Captain Borton. The air mail to Baghdad was a complete success. No money was spent on the Service, but the mails always got through. If the machines came down in the desert there were no refreshment rooms waiting for the crews. The line was run purely under Service conditions, and it saved the mails ten to fourteen days as compared with the ordinary route ever since August 1st last.

At Aden there were only three machines, but they had done extraordinarily good work. Recently they had prevented a renewal of disturbances in Somaliland. A political officer had been murdered there and the usual punitive expedition was suggested. Mr. Churchill put to the Air Ministry the proposal to send two machines across the Straits and across French Somaliland to end the trouble. He (Sir Hugh Trenchard) said that the flight was too risky. Before his opinion had had time to take effect word came from Aden that the two machines had already done it. Mr. Churchill sent the dispatch across to the Air Ministry and had written on it "What about it?" Sir Hugh said that this confirmed his own opinion that the R.A.F. always did twice as much as they ought to do.

In this case the presence of the machines put an end to a probable rising. The guilty tribe handed over the murderers and paid the fine imposed on them, saving probably thousands of pounds and much loss of life. Which showed that the R.A.F. was not only cheap but also humane.

Sir John Salmon had gone to India by order of the Government and already good reports had been received of the usefulness of air action on the North-West Frontier and in Waziristan. Thus he hoped to save still more cash and still more lives.

As to the Air Force at home, the R.A.F. present was to take place in a few days. He wanted to impress on everybody that the Pageant was really the culmination of the R.A.F. training, which aims at reliability and organisation. At the last Pageant the organisation enabled every machine to start for every event within a minute of scheduled time. Such punctuality was not only a military asset, it was a military necessity. The previous day he had been to see a rehearsal of the Pageant at Kenley. Nothing could have been better done. He was against too much in the way of spectacular events at the Pageant, but

the majority of the flying there was of very high value and if the public refused to go to the Pageant the Pageant would still be held, even in the wilds of Salisbury Plain. So long as the public would go to the Pageant then it was right and proper to take the public's money for the benefit of R.A.F. charities.

The punctuality of the R.A.F. was not only shown at the Pageant. Recently a squadron had to be moved to Ireland with all its personnel and transport. The order was given on a Wednesday to uproot them from their peace station. By Saturday evening the whole squadron of twelve machines with all their belongings had landed at their new station. Such things could only be done by unrelenting attention to detail.

As regards what had been done afloat, it was harder to particularise, but the R.A.F. had not lagged behind. In fleet exercises our aircraft were playing an increasingly important and efficient part. Deck landings were more and more successful, torpedo work was increasingly important. This work afloat required as great efficiency in training as did flying over Kurdish hills or Arabian deserts. The R.A.F. people afloat were highly efficient and their difficulties were not small.

He heard good accounts of the first lot of cadets that had left Cranwell. The Staff College at Andover was now a going concern. He had been there the other day and he could say that he had seldom met a more brilliant set of keen young officers, all anxious to improve themselves and to investigate every possibility in the air. They realised that the Air Force was not omnipotent and that there was much to discover. The boys from Halton and Cranwell were gaining a great reputation as mechanics. All this success had been brought about by each unit of each station attending to its own business and by the Air Ministry attending to its business and neither trying to run the business of the other. He added, "That is to say, by you doing your work and me doing my work."

They were not to think that this new Service had no difficulties ahead. It was not for him to discuss what ought to be the size of the Air Service. He was just as much under orders as any of the junior officers and he had to carry out his orders. But they would not be human if they did not like the criticisms recently levelled at the R.A.F., in which it was suggested that they were not strong enough. There had been much in the papers about having no Air Force; he had seen the posters. The critics said that the Air Force was not strong enough or big enough. Whatever might be the controversies of the future, at any rate the Air Force had been formed. It was very small certainly, but it was very efficient.

As to other criticisms, he had seen it stated that they wanted experts for this, that and the other purpose. The policy of the R.A.F. was that all were experts at their own jobs. They were a scientific Service, economical and humane, and he believed that while every officer should be a technical expert, an engine man, photographer, wireless man, bombing man or torpedo man he must also at some time in his career have been a good pilot if he were going to use this great and scientific Service to the best advantage. It would be a retrograde step if they were to break up the Service into small parts consisting of different types of experts. Every one must know about flying and some would specialise in certain branches so as to be more useful when their flying days were over.

He had purposely omitted to deal with any part of the Service for which he was not immediately responsible to the Secretary of State, but he wanted to say that they of the committee side fully realised the urgent and crying importance of research work.

Referring to the guests, he said that the Duke of York was not there as a guest but was a member of the Independent Force and was there as one of them. He said how proud all of them were to see General de Castelnau, Capitaine la Ferrière and Capitaine de Kerillis present. Nobody knew better than His Royal Highness and himself and Group Captain Newall the support they had received from the French.

He said that though it was an impertinence to say so, he would like to add that he had never met a greater officer who took a greater interest in and knew more about aviation than General de Castelnau. Not only did he follow the work of the Air Service in France, but he suggested new ideas for its use which were of high value. He had helped at all times with suggestions and criticisms. Moreover he was as kind to junior officers as he was to seniors.

He well remembered the many pleasant visits he had paid to General de Castelnau's headquarters. He thanked him now and all his French colleagues for the help he had given them. He thought that General de Castelnau instead of being an army officer should have been an air officer, and he felt that really General de Castelnau's heart was in the air.

Sir Hugh Trenchard ended by pointing to the Cross of



the Legion of Honour which he was wearing and saying that this was not the cross given by the French Government, but one which had been presented to him personally by the officers of the French Air Service. He hoped that relations between the French and the English might remain on the same terms as they were during the war so long as he and his own owned that cross.

### The Guests.

Sir Walter Lawrence, proposing the guests, referred to General de Castelnau as a great soldier and a great gentleman. He remarked that there was much debate at present on air matters and suggested that the air was a good subject as all could meet on common grounds of ingenious ignorance. The development of the Air Service called for great patience and vision. Mr. Churchill as father of the Air Services had both these qualities. His patience had more recently been proved in the recent Irish conversations, his vision was undoubted.

Mr. Churchill, replying for the guests said that none except Sir Hugh Trenchard could have evoked the results which he achieved in so short a time. The great quality of Sir Hugh was not promise but performance. He recalled the trials of

the pilots and observers of the Independent Force in their attacks in Germany and pointed out that for a man of sympathy and high honour to launch such an offensive was as great a trial as it was to take part in it.

He himself felt honoured to be present at that gathering but the Independent Force was honoured by the presence of General de Castelnau. No battle in history more than that of the Marne had decided the fate of a nation, but all the work of those that fought on the Marne would have been useless had not the Grand Comroine de Nancy been so devotedly held by General de Castelnau.

Referring contemptuously to the bickerings between British and French newspapers he said that however it might be in the future we must work out our destinies so that England and France should march forward together.

Group Captain Newall then proposed the health of Sir Hugh and Lady Trenchard, a toast which was received with what is usually called musical honours, followed by a special cheer for Master Hugh Trenchard. Thereafter there was much conversation, not of the Churchill-Collins kind, and the gathering finally dispersed somewhere about midnight.—C. G. 6.

## ON THE R.A.F. PAGEANT.

The chief event of the year's aeronautical work takes place on Saturday next, June 24th, when the R.A.F. Pageant is to be held at Hendon. Naturally everybody concerned with aviation will be present if it be physically possible for them. It is alleged by the authorities for the benefit of those who might conceivably be choked off going to the Pageant by the terrible traffic difficulties of previous years that a special traffic scheme has been prepared to deal with approximately 10,000 people. It is to be hoped that this special traffic scheme will not be as farcical as the specially idiotic method of parking cars which was adopted last year.

One's personal advice to those wishing to see the Pageant in comfort is to go early and be prepared to stay late. In any case the gates will be open from 11.30 onwards. Though the Pageant itself is not booked to begin till 15.00 hours there are various preliminary events such as heats

in the Unit Relay Race which will start shortly after 12.00 hours.

So far as the events are concerned the most attractive features of previous Pageants, such as formation flying and crazy flying and what is vulgarly called "stunt flying," will be retained.

### SOME NEW FEATURES.

A new feature in the programme will be a landing competition in which the machines have to land intact inside an area of about 100 yards square surrounded by a fence about 4 feet high, the engines having previously been switched off at a height of a thousand feet. This should provide an excellent method of writing off antiquated machines and should provide much harmless amusement to spectators. If the regulations should be similar to those in a like competition held at Andover last year it will be

held that pilots whose machines cannot be taxied out of the enclosure under their own power will be disqualified.

There will be much interest in a display of fancy flying with a machine equipped with a smoke box similar to that used in sky-writing advertisements. This will enable spectators to follow the precise movements made by a machine when spinning, rolling, and so forth.

An extension of this idea may be shown, if rumour be true, by twelve machines writing R A F in the air simultaneously. Given fine weather this should be a most useful recruiting advertisement. It is to be hoped that no misguided civilian will fly over and write R I F over the top of it.

A variation of the popular low bombing feature will be given this year when a formation proceeds to bomb a tank with practice bombs. There is probably no truth in the rumour that their Lordships of the Admiralty will occupy the tank in order to show their contempt for the R.A.F.

### THE MYSTERY MACHINE.

One of the races in the afternoon is a handicap in which twelve different types of machines will take part. It is stated that the scratch machine is to be one of the latest reconnaissance machines which has not so far been flown in

### NOVELTIES FOR THE PAGEANT:

Top, The Supermarine "Seal" (Napier engine), a boat amphibian; Middle, The Blackburn "Dart" (Napier engine), a torpedo dropper; Bottom, The Westland "Weasel" (Jupiter engine) a two-seater reconnaissance machine: all of which will be new to the general public.



public. No inside information has been vouchsafed to this paper by those responsible for the Pageant, probably owing to the fact that last year one devoted a large amount of space to the subject with the result that some of the Pageant promoters paid THE AEROPLANE the compliment of saying that it spoiled the sale of programmes (and this in spite of the fact that there were not enough programmes to go round), consequently one cannot give even a guess at what this wonderful reconnaissance machine may be.

The very little bit of money which was available for experimental machines last year was spent entirely in an earnest attempt to co-operate with the Navy by providing new machines for sea work. It is possible, however, that for this particular occasion, the R.A.F. may have dug up some experimental machine which was produced either late in the war or before the disintegration of the R.A.F. The only new overland machine is the Avro bomber illustrated below.

#### A REVIEW OF ANCIENTS.

As regards the other eleven types, it may be taken that they will provide an excellent display of ancient history and if the daily papers do their duty they will be able to hold up this "review of ancestors" as another example of the need for the re-equipment of the R.A.F.

The usual spectacular event will take place towards the end of the programme. It had been hoped by some of the more enthusiastic people of the R.A.F. that this might take the form of bombing a battleship. The High Authorities, however, are more tactical and in view of the touchiness of the Navy the excellent idea of showing the public what the First Line of Defence can do was shelved in favour of a "desert stronghold," ostensibly to "demonstrate" the methods adopted so successfully in Somaliland and elsewhere.

One of the most effective shows ever given of this kind was that at Hawkinge last year, when the effect was vastly heightened by the addition of an "archie" gun. It may be supposed that the desert stronghold will not be equipped with anti-aircraft artillery, and so this entertaining feature will be missing. Otherwise the Organising Committee would be committing an unpardonable solecism: that is to say, of course, unless it be assumed that the desert chieftain has managed to acquire a job line in archies from a friend or the French or the British Disposal Board.

#### POSSIBLE NOVELTIES.

One hears that although the actual equipment of the R.A.F. to-day consists entirely of obsolete aeroplanes which ought to have been scrapped two years ago, the R.A.F. will show at the Pageant several machines with which the general public is unfamiliar. These machines will at any rate demonstrate that if the Government had sufficient intelligence to equip the R.A.F. as it should be equipped, our Air Force would be in possession of the best machines in the world. As it is, these comparatively novel machines will be practically the sole existing specimens of their kind, though in one or two instances there may be a second or third experimental machine of the same type in existence.

Among them will be the Avro "Aldershot," a new bomber with a Rolls-Royce "Condor" engine, which is apparently the only new big bomber that the R.A.F. has had produced since the war. There will also be two Westland "Weasels," one with a Siddeley "Jaguar" engine and one with a Bristol "Jupiter." These may possibly be "the latest reconnaissance machine" to which the official notice refers. As a matter of fact, the "Weasels" were designed by the Westland people during the war, and are therefore already about five years old as a type.

By way of demonstrating that the R.A.F. is doing its best for an ungrateful Navy, three genuinely new Naval

machines are to be displayed. The Blackburn "Dart," with a Napier "Lion" engine, is in fact a modification of the Blackburn "Swift" torpedo-dropper which was produced soon after the war. This machine is intended to fly off the decks of ships, where it is hoped that it may alight again.

The Supermarine "Seagull" with a Napier "Lion" engine is to be there, as demonstrating the boat type amphibian. Also the Parnall "Puffin," also with a Napier engine, will illustrate the float type amphibian.

It is curious that one hears nothing of the presence of the Fairey "Pintail" (Napier engine), despite the fact that it has an extraordinarily fine performance and that owing to its variable camber wings it is probably better able to alight on the limited fairway at Hendon than any aeroplane. It is possible that it is not thought advisable by the authorities to exhibit the "Pintail" with its variable camber and tail-trimming gadgets for fear some intelligent member of the Bolshevik Air Staff might learn too much from it. Otherwise it is a pity to have left it out as it is in fact the only machine habitually flying in this country, with the exception of the standard type Fairey seaplanes, which embodies a step in the direction which will ultimately produce the commercial success of aviation.

For analogous reasons it is possible that the Vickers "Viking" Napier engine, of the latest type, is not announced to appear at the Pageant.

Possibly the fact that the Pageant is a purely R.A.F. affair and is not connected with the Department of Civil Aviation, accounts for the absence also of the Vickers "Viking III" and the Westland Limousine, which won the commencement competition for civil aeroplanes at Martlesham in 1920. These machines, it will be remembered, were acquired by the Department of Civil Aviation, and are habitually dragged out from their sheds at Croydon on state occasions to make a show: though, so far as one can gather, they are never flown, and probably by this time it might be difficult to induce them to make the journey by air to Hendon. It is probably only the concrete flooring of their sheds which has prevented them from taking root at Croydon.

As these machines between them, together with the prizes they won, cannot represent very much less than £15,000 of the taxpayers' money it seems rather a pity not to use them, at any rate as part of the *décor* of the Pageant. Still, after all, the Pageant is a display of the R.A.F.'s flying rather than an exhibition of aeroplanes.

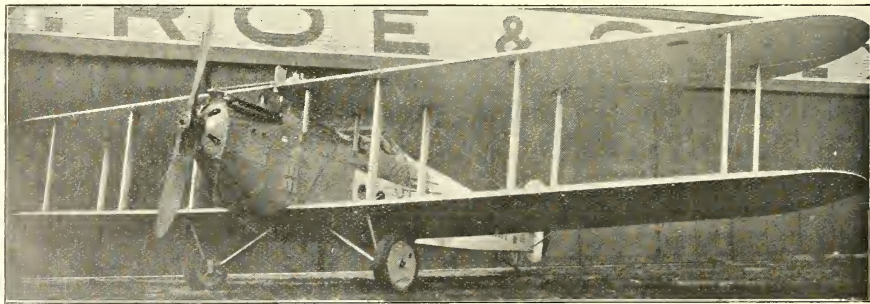
#### PRICES.

The prices of tickets for the enclosures are 2s., 5s., and 10s. respectively. Boxes, in the shape of sheep pens, which accommodate six persons, range from 46 upwards. Cars will be admitted for 5s. The 2s. tickets are only obtainable at the aerodrome on the day of the Pageant itself. Others may be booked in advance from the Honorary Secretary, The R.A.F. Memorial Fund, 7, Iddeleigh House, S.W.1.

Just as a reminder it may be well to draw the attention of past and present R.A.F. people to the fact that the R.A.F. Pageant Dinner takes place on Friday, June 23rd, the night before the Pageant. Those who have not already taken tickets or who come across this information for the first time can buy tickets at the Connaught Rooms, 61, Queen Street, W.C.2, which is about two minutes from the Holborn Tube Station after 19.30 hours on June 23rd. The price of the Officers' dinner is 10s. per head, and of the "Other Ranks" dinner 7s.

Also it may be well to remind people that the W.R.A.F. Old Comrades Association is giving a dance at Caxton Hall, Westminster, on the same evening.

All we can all do now is pray for fine weather and hope that the R.A.F. Annual Gathering on the Friday and the Saturday may be a greater success than ever.—C. G. G.

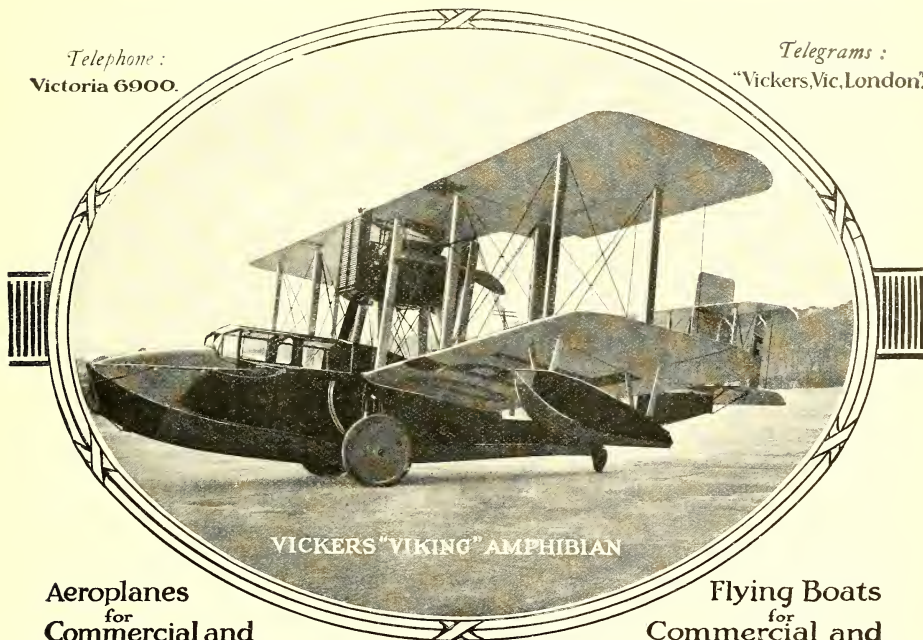


A NOVELTY AT THE PAGEANT: The Avro "Aldershot" (Rolls-Royce "Condor" engine), a long-range bomber The R.A.F.'s only post-bellum war-machine for overland work.



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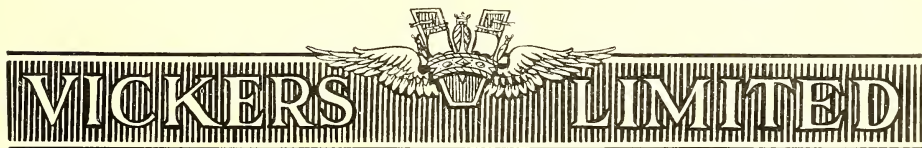
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## THE WEEKLY COMMENTARY.

The tenth Annual Wilbur Wright lecture, read by Lieut.-Colonel A. Ogilvie before the Royal Aeronautical Society, places on record the very thorough manner in which the Wright Brothers made use of the tool Research in their work of overcoming the many difficulties and dangers which confronted their efforts to solve the earlier problem of flight.

To-day the difficulties and dangers of flight are the subject of widespread public discussion. The particular dangers of to-day are of the same nature essentially as those which the Wright Brothers overcame. The same tool Research—properly applied—can alone provide a sound basis for their solution.

Colonel Ogilvie's paper, in its insistence on the importance of research, is one of the most valuable of the

recent contributions to the discussion of the problem of securing safety in the Air.

Certain other contributions to the above-mentioned discussion on Safety in the Air are briefly discussed in a note which follows the report of Colonel Ogilvie's lecture.

An announcement that the proposal to operate a cross-channel seaplane service between Southampton and Le Havre, Cherbourg and the Channel Islands has been approved by the Air Ministry, appears in this issue. This may be regarded as the first step to the development of the only form of commercial aviation which offers immediate prospects of real success in this country.

## THE TENTH WILBUR WRIGHT LECTURE.

The tenth annual lecture dedicated to the memory of Wilbur Wright was read before the Royal Aeronautical Society on June 21st, by Col. Alec. Ogilvie. The title of the lecture was "Some Aspects of Aeronautical Research." The actual matter, as will be seen hereafter, was the work of the Wright Brothers and the lesson which is to be derived therefrom.

The lecture is hereafter reported in abstract.

### THE LECTURE.

It was the wish of the Council of the Royal Aeronautical Society that this year's Wilbur Wright Memorial Lecture should have been prepared and read by an American, in order that the practice of drawing the annual lectures alternatively from Great Britain and America might be more firmly established as a custom.

Unfortunately the arrangements made for this fell through, and you will therefore have to put up with one who, though fully conscious of the eminence of his predecessors, is proud that he has been granted this opportunity of showing his respect and affection for Wilbur Wright.

### WILBUR WRIGHT.

When ten years ago a telegram came from Orville saying that Wilbur had died I felt as if I had lost an elder brother. It was in December, 1908, that I first met him, when he was at Le Mans, demonstrating to the public at large that real flying was an actual accomplished fact.

I had gone to France to learn as much as possible about the design and construction of an aeroplane before setting out to build one of my own, and after visiting the Salon and the works of all the notable constructors, went out to Le Mans to see the Wright machine. There were a thousand or more people waiting on the chance of seeing something, and after an hour or two there actually happened what we had heard about but had only half believed. My diary reads as follows:—

"W. Wright made two wonderful flights in afternoon, all kinds of evolutions, turning, skimming close to ground, gliding without engine from 200 feet. A true and complete flying machine. No chance of speaking to Wright."

Returning a few days afterwards, I found Wright circling the aerodrome for the Michelin Cup. After a time he was brought down by some small defect in the oiling system. A mere trifle had prevented him from making a two-hour flight and there was only one more day to go before the end of the year. Nevertheless, while packing the machine away into its rough shed, deciding upon and carrying out a cure for the lubrication trouble, he was quite calm and unhurried.

After everything was in order for the next day we had a long talk discussing his plans and mine. One could not

help being impressed by his absolute honesty, sincerity and self-control, as well as by his obvious intellectual powers.

### THE FOUNDATIONS OF KNOWLEDGE.

One of the main points which I want to bring out is that Wilbur and Orville Wright based the whole of their knowledge on solid foundations, and that if they had not done so it would not have been possible for them to have overcome the difficulties which they encountered. It is my firm belief that without that demonstration and example the aeroplane as we know it to-day would not exist.

It is also my firm belief that our rapid technical development during the war period was mainly due to the solid research work which was done in the laboratories of this country between the years 1900 and 1914. There is some danger that the real lessons of the past have not been understood and taken to heart, and I therefore take leave to conduct you again over some old ground that we may see if there is not something there which will help us in the future.

It has been generally accepted that the Wrights were experimenters who grasped the essentials of the problem of flying, and tackled them in a practical and intelligent way. Also that they were the real and true pioneers of mechanical flight in December, 1903. But there are still eminent and distinguished men who believe that this success was really due to the superior flying skill and technique of the two brothers. They do not appreciate that it was a demonstration of a firm structure of knowledge based on experimental work of the most solid kind.

It is greatly to be deplored that it has not been possible to publish the results of the wind-channel work which was done at Dayton after the 1901 gliding was over, because the actual figures of these experiments would have dispelled the last doubt. However, a study of the results attained affords evidence which should be sufficient to convince.

### THE 1910 WRIGHT RACER.

Take the small racing machine which in 1910 the Wrights produced to compete in the Gordon Bennett Cup and compare it with their standard machine. It is obvious, even more so now than it was then, that both machines were designed on a scientific basis founded on definite data.

The aspect ratio is about the same in both machines, i.e., about 6 to 1; and the gap chord ratio about 1, both of which are standard practice to-day. The bold increase in the surface loading from 23½ to 6 lbs. per square foot should also be noted.

I was in Dayton during the time the machine was being designed and built, and saw how reference was continually being made to little pocket-books, in which were collated the results of the wind-channel research work carried on during the winter of 1901-1902. It was known that the French fliers

would be using the new 70-h.p. Gnome, an engine of good power for weight, and one which was considered by many almost too powerful for a single-seated machine.

The Wrights made up their minds that they would have to double the speed of their standard machine to win. They were much behind time, and had to make the utmost use of their standard equipment. They designed and built a machine of less than one-third the area, two-thirds of the weight and double the power of their standard machine.

When first flown by Orville the machine came up to its designed performance in perfect balance and control. It is doubtful if any aeronautical designer of the present day, with all the knowledge now at his disposal, could make so immediate a success of so radical a departure.

#### HISTORY OF EXPERIMENTAL WORK.

To get a grasp of the processes of research and technical development, through which Wilbur Wright and his brother passed, it would be well to recall briefly the history of their experimental work. In 1900, after absorbing all available information and following particularly the path indicated by Lilienthal, they built their first glider with biplane wings 18 ft. span by 5 ft. chord, incorporating a warping device for lateral control and a front elevator for fore and aft control.

The Wrights knew that they wanted to give different angles of incidence to the two wing ends to obtain the lateral control which was necessary. Wilbur was explaining to an interested audience what was wanted and was using an old open-ended cardboard box to illustrate his remarks. As he was holding it by the two ends and twisting it about, he suddenly realised that in his hands he had a biplane structure firmly braced in two planes, but able to be twisted at the two open ends, and that this was just what was wanted for the lateral control of a flying machine.

The elevator or horizontal rudder was another device worked out to meet another known difficulty, that of controlling the movement of the centre of pressure.

On trial, the 1900 machine did not come up to expectation. The resistance of the planes was remarkably low, but the lift did not come nearly up to the figure deduced from Lilienthal's tables, upon which the machine had been designed. The next year exactly the same type of machine and arrangement was followed, but the area was nearly doubled.

#### CONTROL DIFFICULTIES.

At first this 1901 machine could only be controlled with extreme difficulty, as it insisted on climbing steeply or diving. The trouble was traced to the big camber of the planes causing excessive movements of the centre of pressure. After this was cured, some good glides were obtained. Octave Chanute was stopping at the Wrights' camp and told them that they were well in advance of any other experimenters. Nevertheless, the Wrights themselves were at the end of 1901 considerably discouraged, as they were then beginning to appreciate how much there was to be done.

They saw that their experiments showed that they had no sound knowledge as to the lift, or the resistance, or the centre of pressure movement of a curved plane, much less how such knowledge, if they had it, was to be applied to obtain a practical controllable aeroplane.

Fortunately, they were sufficiently courageous to commit themselves to a lengthy programme of laboratory research. This was the real starting point of their ultimate success.

During the years when I was in touch with the Wrights we were more interested in the application of the results than in the method by which they had been obtained. To my regret I did not pay to the details of this work the attention which I now realise was due.

#### THE DAYTON WIND CHANNEL.

I saw parts of the 16 in. channel apparatus lying about and examined some of the little metal aerofoils tested. My recollection of these is that they were about 6 in. by 2 in., and that the method of measurement used was one of comparison against a variable area presented normally to the wind stream. A great deal of time and trouble was spent in getting the apparatus to function in a satisfactory manner, but once it was tuned up tests were conducted with great rapidity, and we have the solid fact that full scale design based on this work was entirely satisfactory.

An immediate effect of the channel work was seen in the 1902 glider, which had an aspect ratio of 6 and a fixed fin behind the planes. The gliding angle was found to be considerably better than the year before.

The first stage in the search for control had been the warping wings; the fixed fin of 1902 was the second stage and was the result of a study of the lift and drag figures obtained in the laboratory. From these they found an explanation for the occasional failures of the lateral control, when the lower wing continued to drop although its angle of incidence had been increased. What was happening was that the drag of that wing was increased and its speed decreased and this loss of speed more than counteracted the increase of angle. By means of the fixed fin the Wrights expected to hold the wing

up to its work and make the warp operate properly, and up to a certain point it did so.

The 1902 glider with the fixed fin undoubtedly was an improvement, but still it was not right. When the machine side-slipped the fixed fin tended to turn the machine, speeding up the upper wing and slowing down the lower and so increasing the bank. This difficulty was eventually met by making the fin an adjustable one which could be turned to obtain the necessary pressure on the side towards the upper wing. It is hard to believe that the Wrights would have so quickly found a way through the tangle of these problems of control without the fundamental characteristics of an aerofoil to fall back upon.

When the first power machine was being designed they were able to go straight ahead without serious difficulty until they found themselves up against the design of the propeller. This proved to be a very serious obstacle and was not surmounted for several months. The first power flights of December, 1903, were, apart from their great historical importance, really only a practical demonstration of the research work and technical development of the preceding three years.

During the next two years experimental flying was continually being held up by difficulties which could only be met by going back to the first principles and the characteristics of an aerofoil. As an instance, they had trouble with instability on a turn which afterwards turned out to be due to stalling. The 1905 machine was flying with so small a margin of power that sometimes on the turn the angle of incidence of the lower wing tip would exceed the "critical angle" of lift and lateral control would be lost. Serious accidents are still occurring from this cause.

It was eight or nine years before clear explanations of the stalling of an aeroplane on the straight or on a turn were available.

#### THE LESSON OF THE WRIGHTS' WORK

The first lesson to be learnt from the work of the Wright brothers is of the immense importance of fundamental research work.

Another very important lesson to be drawn is as to the value of the closest co-operation between laboratory and field work.

The first period was devoted to the study of all the available information and to thought about the essentials of the problem. Then came two periods of practical experiment in the field. This full-scale work gave the Wrights a good deal of experience and confidence, but it also made it clear that whether they liked it or not, they had to go back again to the beginning and get down to fundamental research—the only foundation on which a permanent structure could be built.

With data in their possession they returned to the application of it with immediate success and from then on their progress was steady and continuous.

It is not my wish to exaggerate the importance of the work of the Wright brothers, but it is my desire to lay emphasis on the lessons to be learnt therefrom, namely, that the whole basis of aeronautical progress rests upon genuine research in the laboratory, on the development of mathematical lines of attack and on full-scale research work in the field, and cannot possibly rest only or even mainly upon technical development.

Brilliant craft-men and engineers though they were, it is certain that the Wrights would never have solved the problem of flight if they had not the fundamental data to guide them in times of difficulty.

#### RESEARCH IN ENGLAND.

Turning to the immediate pre-war period, we find that aeronautical research in this country was put on a very solid foundation, and between 1909 and 1914 a very large amount of the necessary fundamental data was obtained at the National Physical Laboratory, at the Royal Aircraft Factory, and by independent experimenters. Both the official establishments were generously supported from national funds and all the necessary elaborate apparatus was built, developed and worked at high pressure.

Before the outbreak of the war complete information was available for designers as to the lift, drag and centre of pressure movement of a wide range of aerofoil sections, as well as for a large number of complete models. Figures were available as to the actual pressures experienced over the upper and lower surfaces of the aerofoil. The relations between model and full scale had reached a state of knowledge almost as far advanced as to-day.

Resistance of parts, such as bodies, struts, wires, wheels, etc., had been measured. The main problems of longitudinal stability had been investigated. As regards lateral and directional stability, the problems had been dealt with on mathematical lines and the lines of experimental investigation determined. The complete solutions to these problems have not yet been found.



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The strength requirements and methods of stress calculation had been settled and the load factors then decided upon are substantially the same to-day. All the main facts as regards propeller design and manufacture were available.

Finally, practically all this information had been checked by full-scale work and all the instruments really essential for the safety of the pilot had been designed and tested.

It is impossible to read again the Advisory Committee reports up to the beginning of the war without being astonished at the wide range of the work and the accuracy of the deductions.

#### PROGRESS IN THE WAR PERIOD.

It is frequently stated that aeronautical progress under the stimulus of war was rapid and continuous. This statement is only true to a limited degree. Progress in the art of flying itself was certainly both rapid and continuous, as also was the progress in methods of construction, materials and design from the engineering standpoint.

Great also was the progress in aircraft engines as regards power, reliability, efficiency and reduction of weight. To this progress in engines is due almost entirely the tremendous increase in performance which was so marked a feature during the war.

In regard to progress in aerodynamics during this period, it is accurate to state that substantially there was none. Practically as much weight per horse-power could be carried in 1914 as in 1919 and as safely. This was only to be expected, since during such urgent times efforts were concentrated on technical development on what was known to be on sound lines rather than on researches, which were of necessity to some extent vague and indefinite and possibly of no immediate practical utility.

#### RESEARCH IN THE POST-WAR PERIOD.

Since the war, money and the national effort put into research have steadily dwindled until it is now far below the pre-war standard. At the present date the few, extremely few, private firms who are left are so hard pressed to keep on their feet at all that they find it impossible to continue to devote their resources to anything outside the fulfilment of definite orders. As for private individuals they are, to the best of my knowledge, completely extinguished by the heavy hand of fate.

One of the most unfortunate results of the concentration during the war of all aeronautical matters into the hands of the State is that individual effort is now almost paralysed, and it is impossible for any one man to sympathise with the wide aspects of aircraft research, particularly when continually harassed by orders to cut down his expenditure.

To all interested in sound aeronautical development it is evident that the importance of fundamental research to real progress in aircraft design is not grasped by those in authority.

The initial problems are solved and technical development has gone far, but if the flying machine is to be of real benefit to the world and to be a real means of rapid communication, then big advances are necessary. Such advances are only to be obtained by laborious and systematic researches into the problems we can see dimly as well as those we can see more clearly.

#### THE IMMEDIATE PROBLEMS.

The immediate problems are those directed towards the improvement of the aeroplane so as to increase its safety. The obvious defects are, that its minimum flying speed is too great and that the stability and controllability round about this speed are insufficient.

It is foolish to put the responsibility for accidents on the engine and to say that all that is necessary is so to improve the reliability of engine and installation that breakdowns cannot occur. Certainly the majority of interruptions are traceable to some breakdown in the power plant in which greater experience and care will undoubtedly make big improvements; but it can never be the case that mechanical breakdowns are absolutely impossible and it is essential that emergency landings can be accomplished without danger to the passengers or without even anxiety to the pilot. This is far from being the case at the present time and it is a mistake to attempt to conceal it.

To the future of civil aeronautics the importance of safety is paramount and supreme over all other considerations, and the efforts which are now being made to improve stability and controllability round about stalling speed are all to the good. The other main problem, that of decreasing the dangers at the landing itself, cannot be attacked in an adequate manner until funds are available. This problem has two branches, one a decrease in the minimum flying speed keeping the top speed about the same, and the other, an increase in the strength and efficiency of the landing mechanism itself. These are the immediate needs of the aeroplane itself.

Further off we can see big advances which will be possible when we have a real understanding of the action of an aerofoil in the air, and how and why the air flows round it and gives it lift and drag. A brilliant experiment may show, and indeed has shown, that we are on the outskirts of knowledge, but before we can attain the citadel we must give encouragement and adequate support to the men who are devoting themselves to research of this character.

It is conceivable that lines of advance may then reveal themselves which would make it worth while to attempt even the design of a helicopter, but let us recognise that the present time is one requiring research work into the fundamental problems which must be solved before the world at large can reap the benefits of the wonderful achievement of Wilbur Wright and his brother.

## SAFETY IN THE AIR.

The regrettable accident to the Spad—which crashed in the Channel on June 3rd—has been the occasion of much discussion in the Daily Press. It is natural that this particular accident, which is one of an abnormal type whose exact cause is likely to remain unknown, should have aroused public interest, while the relatively regular incident of engine failure, leading to a forced landing, should have continued almost unnoticed by the Press until this particular event aroused its present activity.

It is to be recognised, however, that generally speaking, the facts have been seen in fairly correct perspective, and that in the general discussion on "Safety in the Air" the whole question of reliability of machines, engines, and ground organisation has been considered, and not merely the unknown cause of this specific accident. Nevertheless, as is natural, a good deal of rubbish—some of it over well-known signatures—has been published on the subject.

The parachute maniac who borrowed Rear Admiral Mark Kerr's name to ventilate his views in the *Times* of Saturday, 10th, is very example of one of the types of mind who are mischievously stimulated by accidents of this class.

Mr. Asquith's lament concerning the air-sickness of his daughters is in some ways a more serious portent, for Mr. Asquith has, after all, a very respectable intellect, and although his ignorance of aeronautics may be as limitless as it appears, yet a vast multitude of mankind of equal ignorance with him will be content to accept for themselves his estimate of the dangers and discomforts of air travel.

That, however, is a difficulty which any new and revolutionary art must necessarily face—the motor car, and before it the railway, encountered, and eventually vanquished the Asquiths of their day.

But one may very properly quarrel with those who claim to be supporters of aviation who do harm to the cause by making baseless or unverified statements concerning its dangers.

The letter from Brig.-Gen. P. R. C. Groves, which appeared

in the *Times* on June 10th, is one which should never have been written.

General Groves does not know whether the present system of medical examination of pilots is adequate.

He does not know whether the medical officers responsible are properly acquainted with the results of the researches upon the medical aspects of flying made during the war.

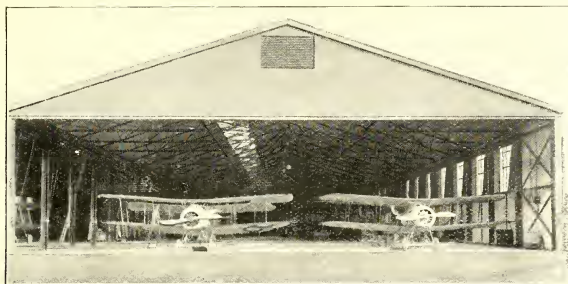
He "has reason to believe" that certain pilots have been overworked to the danger point.

Although he declares that "the airworthiness of all the British types of machine engaged on the cross-Channel Services is beyond question," yet he thinks that machines and engines may be worked "beyond the period when an overhaul is desirable—if not absolutely necessary."

General Groves has been held up to the world at large as an authority upon aviation. He is in a position to acquaint himself with the facts concerning the above-mentioned questions. And if he has not sufficient confidence in his own judgment on those facts to give a clearly defined statement of his opinions, he has no right to fill the public with vague allusions due to his own personal lack of confidence.

When he makes the more or less definite statement that "variable incidence of planes" would ensure slow landing," he displays a cocksureness that would not be shared by any person technically competent to give an opinion on this subject, and leads one to suppose that he is thinking of a device to which he is not even able to append the correct name.

Aviation has already suffered much at the hands of those of its friends whose most outstanding qualities are strictly limited knowledge and unlimited confidence in the sufficiency of that knowledge. One is entitled to ask that any of its supporters who have the opportunities for acquiring correct information which must be available to General Groves should at least get their facts and their nomenclature correct before assuming the role of instructor to the public.—W. H. S.



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### A CROSS-CHANNEL SEAPLANE SERVICE.

An Air Ministry communiqué, issued on June 14th, makes a definite statement as to the cross-channel seaplane undertaking which has for some time past been the subject of vague rumour. The scheme, which is to be operated by a company now in process of formation, probably with the title of "The British Marine Air Navigation Company," has been approved by the Air Ministry, and will be operated under the general terms of the subsidy scheme which was published in June, 1921.

Services are to be run by seaplane between Cherbourg and Southampton, and Le Havre and Southampton, the main object of the scheme being (a) to shorten the cross-Atlantic journey to London by picking up passengers at Cherbourg and bringing them to Southampton, and (b) to speed up the London-Paris service via Southampton and Le Havre by carrying passengers and mail by seaplane instead of by boat. Subsequently, it is proposed to operate a passenger and mail service between Southampton and the Channel Isles.

The services are to be carried out by aircraft designed and built by the Supermarine Aviation Works, Ltd., of Southampton. The scheme has the support of the London and South-Western Railway Company, who will actively co-operate in the matter of through bookings and railway connections, and the French railway companies concerned are to assist by providing suitable train connections for the through route to Paris.

The operating company will receive a subsidy 25 per cent. of the gross earnings from passengers, goods and mail, plus a payment of £1 10s. per passenger and 1½d. per lb. of goods carried. These latter sums are half of the similar payments made on the London-Paris route.

This enterprise marks a very important step forward in the development of real commercial aviation, and every one who is acquainted with the history of the Supermarine Aviation Works, Ltd., will hope that the venture will be as successful as it deserves to be, and will bring to them—as the constructors of the machine to be used—an adequate reward for their persistent faith in the value of marine aircraft for transport purposes.

### THE S.B.A.C.'S NEW OFFICIALS.

Mr. C. R. Fairey, M.B.E. (Chairman of the Fairey Aviation Co., Ltd.), has been elected Chairman of the Society of British Aircraft Constructors for the year 1922-23. Captain P. D. Acland (Vickers, Ltd.) has been elected Vice-Chairman and Sq/Comdr. James Bird (Supermarine Aviation Works, Ltd.) Hon. Treasurer.

Sir Henry White-Smith, C.B.E., the retiring Chairman, who has been Chairman of the Society since its formation in 1916, becomes Past-Chairman.

[Everyone will congratulate both the S.B.A.C. and Messrs. Fairey, Acland, and Bird upon their new appointments. Very particularly will those who have a faith in the seaplane welcome the fact there can for the following year be no suspicion that the S.B.A.C. will forget the existence of this type of aircraft.—Ed.]

### THE NEW TWO-SEATER JUNKERS MONOPLANE.

The attached photograph shows a small two-seater machine built to the designs of Dr. Junkers of Dessau. Owing to the activities of the Aeronautical Commission of Control—which prohibited the building of aircraft in Germany up to May 5th—the machine had to be built in another country. Experimental work on this particular type has occupied some 15 months, and has included tests to discover a satisfactory engine, experiments with wings arranged at the bottom of the fuselage as in previous Junkers' monoplanes, and finally with the present arrangement.

Like the previous Junkers, the machine is of all-metal structure, using the characteristic corrugated thin sheet

duralumin covering. The wing, of thick section, built on multiple tubular spars, is of 17 metres span and is built in one piece. It is attached to the top of the fuselage, and its leading edge is cut out to accommodate the pilot's head—very much as in the case of the Fokker F.III type.

The wing is also recessed on its under surface to accommodate the petrol tank—which is fixed actually to the top of the fuselage behind the pilot, but is enclosed by the wing when this is in position.

Behind the pilot and under the wing is a passenger cabin, large enough to accommodate two passengers, with a side entrance on the starboard side.

The undercarriage consists of two axles, hinged to a sort of rudimentary keel below the breast of the fuselage, a pair of thrust tubes, lying behind the axle, but also approximately horizontal, and a nearly vertical telescopic strut, fitted with shock absorbers fixed to the axle ends and to the fuselage side.

The engine is one of the 50 h.p. 5 cylinder radial air-cooled Siemens Halske type, fitted to the nose of the fuselage, and very thoroughly cowled in. The direct driven airscrew carries on its boss a forward projecting cylindrical nose of some length, which is meant to protect the engine from contact with the ground in case of the machine standing on its nose.

The machine is designed for high-speed special transport work—such as newspaper work of the type associated with the name of Mr. Cobham in this country. Normally with full tanks it carries one passenger and a fair amount of baggage. With reduced fuel or with little or no baggage two passengers may be carried.

No precise details of dimensions, weight, or performance are yet available, but it is hoped that these may be available shortly.

### SKY WRITING.

The exhibitions of advertising by means of smoke writing, which have been so much in evidence lately, are the result of the work of Major J. C. Savage, who in pre-war days was manager for the late Mr. B. C. Hucks, and after the war was in charge of the London office of the B.A.T. Co., now in suspense, of which the moving spirit is Lord Waring.

Major Savage has been working on the problem for over two years. The machine used is an S.E.5a, and the pilot is Mr. Cyril Turner, a well-known pilot of B.A.T. machines, when that company was worth mentioning.—G. D.

### A NEW COMPANY.

GRANVILLE BRADSHAW, LTD., was registered on June 9th as a private company with a nominal capital of £40,000 in £1 shares. The objects are: To adopt an agreement with G. Bradshaw and G. Campling, and to carry on the business of designers, inventors and patentees of internal combustion engines of all kinds, motor cars, cycles and tractors, aeroplanes, stationary and marine engines, etc. The subscribers (each with one share) are:—B. H. Rogers, "Rathgar," Ashley Road, Walton-on-Thames, draughtsman, and Alice M. Crook, 89, Kempse Road, N.W.6, secretary.

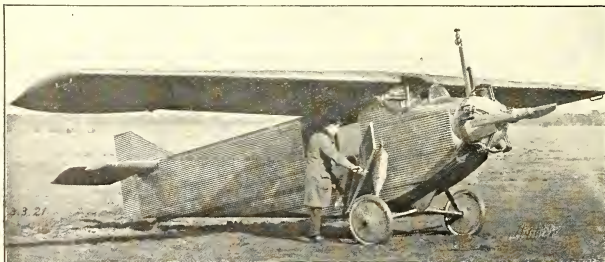
The first directors are:—The Rt. Hon. Sir Charles Hobhouse, Bt., M.P., G. Bradshaw and G. Campling. Remuneration:—£250 each per annum. The registered office is at 99, Jernyn Street, S.W.

### MORTGAGES, CHARGES & SATISFACTIONS.

HARROGATE AERODROME AND LAND DEVELOPMENT CO.—Mortgage on land in Harrogate, a perpetual yearly rent charged, dated March 4th, 1922, to secure £11,000. Holders:—N. M. Hudson and T. G. Hudson, of Pannell, Yorks. (Registered June 8th, pursuant to Order of Court.)

### RECEIVERSHIP.

A. G. S. MANUFACTURING CO., LTD.—D. H. Allen, of 4, Fenchurch Avenue, E.C., ceased to act as receiver or manager on March 24th, 1922.



**THE NEW JUNKERS TWO-SEATER.**—This machine is briefly described above. Dr. Junkers has abandoned the arrangement of the fuselage above the wing used in his previous machines, in favour of the more usual wing on top arrangement. Otherwise the construction is on the lines previously used by this designer.

It is an interesting comment on the Allied restrictions on German Aircraft that it having been decreed that no German single-seater shall have an engine of more than 60 h.p. a German designer should forthwith produce a useful three-seater of 50 h.p.

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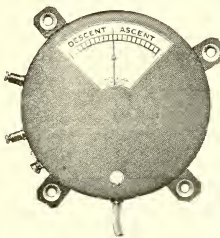
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Each division of the scale indicates a rise or fall of five feet but the actual calibration can be made more or less sensitive, as desired. It is fitted with a transparent dial for night flying which is illuminated from behind by means of a small electric lamp. The Smith Statoscope is a great advance on the bubble type, being easier to read and more simple to fix in position.



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## COMMERCIAL AERONAUTICS.

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## CONTINENTAL ARRIVALS AND DEPARTURES.

ABBREVIATIONS.—A.D.—Aircraft Dispatch Co. B.A.—Berkshire Aviation Co. B.C.—Bristol Aeroplane Co. C.A.—Department of Civil Aviation. D.A.—Daimler Airway. D.H.—De Havilland Aircraft Co. G.E.—Compagnie des Grands Express Aériens. H.P.—Handley Page Transport Ltd. I.L.—Instone Air Line. K.L.—Koninklijke Luchtvaart Maatschappij. L.A.—Leatherhead Aviation Services. M.A.—Messageries Aériennes. M.W.—Marconi Wireless Telegraph Co. Ltd. P.O.—Privately owned. P.L.—Pettors Ltd. S.F.—Surrey Flying Services.

## ANALYSIS OF FIGURES.

Number of trips made during week.—L.L. 30, H.P. 15, D.A. 18, M.A. 49, G.E. 5, K.L. 99, D.H. 2.

Number of passengers carried.—L.L. 51, H.P. 62, D.A. 25, M.A. 11, G.E. 6, K.L. 15, D.H. 2.

Total number of trips by British machines: 45 carrying 136 passengers. Total number of trips by foreign machines: 45 carrying 32 passengers.

Crews of machines, 135.

Trips per day.—Monday June 12th, 21; Tuesday 13th, 25; Wednesday 14th, 3; Thursday 15th, 1; Friday 16th, 24; Saturday 17th, 25; Sunday 18th, 9.

## STATISTICS.

Machines, 106; Passengers, 108; Crews, 135; Total Personnel, 303.

Corresponding week last year:—

Machines, 91; Passengers, 300; Crews, 107; Total Personnel, 407.

Corresponding week, 1921:—

Machines, 94; Passengers, 191; Crews, 117; Total Personnel, 311.

## NOTES OF THE WEEK.

Capt. Stocken has been testing D.H.s again during the week and also an Avro, which Mr. Hayns later delivered to Brussels.

Three S.E.5a's have been prepared for this week's air meeting at Brussels. Major Foot, Capt. Stocken and Mr. Hayns will fly these over to-day (Wednesday).

Mr. Muir was conducting height tests on the D.H.5a with Rolls-Royce engine, which Capt. Stocken flew in the races.

Handley Page Transport are sending the newest W.5b G-EEBI over to Brussels for the meeting and she will be flown by Major Foot and Mr. MacIntosh, who will take her over on Saturday. G-EEBI is the fastest of the three and goes up like a scout even with a full load of passengers and goods.

Judging from performance it seems that the next new Handley Page product will be a W.5 fitted with a pair of 240 h.p. Siddeley "Pumas," which will take off without any run.

Seriously, however, these W.5s are singularly fine machines and their landing speed seems to be even lower than the 0/400, and one is told that they will cruise comfortably at 85 m.p.h.

Mr. O. P. Jones forced-landed on the Instone Westland G-EART during the week and stood the machine on its nose.

On Wednesday, when there was much rain and low cloud, Mr. Jones, flying a D.H.34, was the only British pilot to complete a trip. He brought a D.H.34 through from Brussels in just over 2 hours.

The same day Mr. Geysendorffer took a Fokker from London to Rotterdam, and Mr. Smirnoff, an erstwhile S.N.E.T.A. pilot, came through on a similar machine from Rotterdam.

The weather in England was so thick that Mr. Smirnoff was unable to follow the railway further than Ashford, so he struck off north until he hit the Thames, which he followed west until he sighted the Crystal Palace. From here he got his direction on the aerodrome by sighting along the towers and finally made the aerodrome. Mr. Smirnoff was one of the group of Russian cadets who were being trained by the R.A.F. towards the end of the war.

On Friday Mr. Barnard, with Mr. Holmes as passenger, flew over to Brooklands in the Instone Westland to fetch the "Vimy." On test, however, she was found to be in need of adjustment as her landing speed is too high, and so she will not be ready for a few days yet.

The "Vulcan" is quickly being initiated into the ways of air lines and has been hard at it during the week. On Sunday Mr. Bradly came in from Paris, showing that he is still a fine exponent of "Brighter London" landings.

Various Instone pilots have been doing trial trips on the "Vulcan" during the week.

The Bristol lo-seater has gone to Bristol for general overhaul.

The Daimler Airway are still carrying on their four trips per day with G-EEBs, which machine is showing no signs of over-work.

Mr. Hall is of opinion that it is possibly actually overwork for an engine to keep on running continuously, since it then is kept warm all day instead of going through continual changes from hot to cold.

The Daimler people have decided in future always to send a second qualified pilot, or if such is not available someone capable of flying and landing the machine. Mr. Dickinson has recently been making the trip four times daily, and it is thought that very soon he will be able to recognise the Channel every time he sees it, and eventually he will know every "atmospheric" by name.

Apologies, these have been very prevalent during the past week, and Messrs. Munday and Fitch have been kept very busy chasing the little beggars off the

aerials. What a pity it is that no one can invent a species of wireless Keating's powder so that the air can be kept free of all kinds, both curly and straight, surly and friendly. It would make wireless telephony so much more pleasant.

On Tuesday Mr. Robinson, on the Daimler D.H.34, was compelled by weather to land at New Romney, and in the process he eliminated a sheep with his tail skid. However, owing to the colour of the Daimler machine, there were no marks of the slaughter to be seen.

On Thursday the only machine to get through the wet was Mr. Shepperson, on the Instone "Vulcan," who left late in the afternoon for Brussels. Mr. MacIntosh, who, as stated in these notes some time ago, has now joined the Instone Air Line, completed his licence tests last week and took the Westland to Paris.

Mr. Muir has been carrying passengers on his Avro, and earlier in the week was testing a Greek parachute, which proved highly satisfactory.

During the week-end, Mr. Leavey was flying with a blood-red Avro. This machine has numerous holes all over the wing, now patched, which holes were made by hailstones in a recent storm.

Mr. Chattaway, late of the Instone Air Line, has now been appointed a C.A.T.O. at Croydon. As Mr. Chattaway has been a pilot on the service, his appointment is in every way excellent. It is lucky for some people that he has a forgiving spirit.

Mr. Greig, of Basil Foster's, late of the Messageries Aériennes, has for the moment deserted the aerodrome for the tennis court, where he has met with much success, reaching the semi-final in the men's doubles and mixed doubles in the Beckenham Tennis Tournament. Mr. Greig is considered to be one of England's young hopefuls—at tennis.—G. D.

## Brooklands.

A cable has been received at the Vickers' works from Canada to the effect that the "Viking," which was recently sent over there for the use of the Canadian Forestry Department, has passed all its trials extremely satisfactorily.

Mr. Muller states that the designing staff of Vickers' are now busy with the first projected "absolutely and entirely" metal machine. He points out that it is of little use to proceed to design an all-metal machine on the lines of the present wooden machines, and accordingly new principles will be embodied in the new Vickers' machine. For instance, it is proposed to abolish the spar system in the wings, and build up the latter to act as spars in themselves, so that the wing-loading is carried by the whole wing, or rather distributed over the whole chord, and not taken at two points, as is the case at present.

The Vickers works have received instructions to re-condition three Vimy bombers taken from Disposals stock. These will be flown in the R.A.F. Pageant.—J. F. S.

## A WANDEKER RETURNS.

Major F. B. Fowler, late I.A.-Commander (Attd.) I.J.N., and Squadron Commander R.N.A.S., is returning from Japan, arriving in England July 1st.

He was one of the first officers to join the British Aviation Mission in January, 1921, as Officer-in-Charge of Flying. For the last six months he has been Second-in-Command but had to return home for business reasons, and the loss of his services, which have been invaluable, is much regretted.

Major Fowler will be glad to give any information in his power to the relatives of those still serving in Japan, or any others interested, on application to his address, Belhurst, Hurstmonceux, Sussex.

## A MATTER OF FACT.

The following letter was received on June 17th:—

6, Portland Place, W.1.

June 12th, 1922.

Dear Sir,—My attention has been drawn to a paragraph in your paper, *THE AEROPLANE*, of June 7th, 1922, under "Birthday Honours" which refers to me.

I see that in this paragraph you describe me as being the first Jewish peer to be connected with Aviation.

Although it is true that I am interested in Aviation, your statement that I am a Jew is quite inaccurate.

I was born in Lancashire and neither of my parents were Jews, and, in fact, I am descended from a family that have been settled in Ireland for the past three hundred years.

Although I have the greatest respect for the Jewish race and have the privilege of numbering among my most intimate friends many of that religion, I shall be glad if you will kindly insert this letter in your next issue.

Yours faithfully,—(Signed) S. J. WARING.

The Editor, *THE AEROPLANE*, 31, Essex Street, W.C.

[The delay in publishing this letter is due to the fact that it was sent to an address with which this paper has never had any connection.—Ed.]



### A STEP FORWARD.

One of the most important steps in the history of civil aviation is announced by the communiqué from the Air Ministry which is published in the "Aeronautical Engineering" Supplement this week, and gives certain details of the proposal by the Supermarine Aviation Works, Ltd., and the London and South Western Railway, Ltd., to run joint air-lines, equipped with Supermarine flying boats, between Southampton and Le Havre, Cherbourg and the Channel Islands.

Perhaps the most important fact in connection with this forward step is that the proposed air line, instead of running in opposition to railway and steamboat services, is in fact to be run in conjunction with them.

The London and South Western Railway is to be congratulated on having been the first of all our great railway systems to appreciate the value of aircraft. No doubt, in time, we shall see the Great Eastern Railway Co. running seaplane services from Harwich to Holland, and the North Eastern Railway Co. running services from Hull or Newcastle to Germany and the Scandinavian ports. But to the South Western Co. there will always remain the credit of being the first railway company to come into aviation.

The Supermarine Aviation Works, Ltd., similarly deserve credit for being the first aircraft firm to convince any of the older methods of transport that aircraft can be a useful auxiliary. Mr. Hubert Scott Paine the moving spirit of the Supermarine firm, and its energetic collaborator Squadron-Commander James Bird, late R.N.A.S., have long been recognised as among the most far-seeing and clearest-thinking members of the Aircraft Industry.

It is possible that as a route to Paris the Southampton—Le Havre air line will not be as quick as the direct air line from Croydon to Le Bourget, but if the Supermarine flying boats start on time and if the rail connections are reasonable there should not be very much difference.

Where the Southampton air line is most likely to be of value is in transporting passengers and probable mails from Cherbourg to Southampton and *vice versa*.

The service from Southampton to the Channel Islands is not likely to be a very paying concern at first, but this also may become a commercial proposition in time.

It is proposed to start the service in the coming autumn so that the operators of the line may acquire experience during the winter and get into full running order at the beginning of next year. It will be interesting during that period to see how the regularity of the seaplane line works out in comparison with the Croydon—Le Bourget services. A few miles of Channel fog holds up the Croydon—Le Bourget line, even when the weather is perfectly clear over the major part of the route. When there is a Channel fog it means that the whole of the Southampton—Le Havre line will be in fog, and it will be very interesting to see whether the boats get through when the land machines do not.

If the French can be induced to install a proper wireless directional station at Le Havre there should be very little difficulty in this respect, for a flying boat can get down in a fog in the open sea in case of engine failure with much less risk than a land machine can get down in any country.

In this connection it is of considerable interest to note that during the later years of the war, when the R.N.A.S., and subsequently the R.A.F., were running the long North Sea patrols with twin-engined Porte boats from Felixstowe and Yarmouth, they never lost a man except through enemy action. A certain number of the boats were shot down by German seaplanes, but all those which came down in the sea through ordinary engine failure either got off again, or came home on the surface under their own power, or else

the crews were picked up by surface ships. The big flying boats proved themselves to be extraordinarily seaworthy, some of them even surviving being towed right across the North Sea by the Royal Navy, which at no time is remarkable for its tenderness in handling craft of any kind. This interesting fact should also considerably affect the insurance of aircraft, goods and passengers, on the new air line.

Altogether the new scheme is quite the most interesting event which has occurred in connection with Civil Aviation since the late lamented Air Transport and Travel, Ltd., and Handley Page Transport, Ltd., began running their lines to Paris and Brussels. One can only hope that the flying-boat line will have greater success than has attended overland commercial aviation up to the present.—C. G. C.

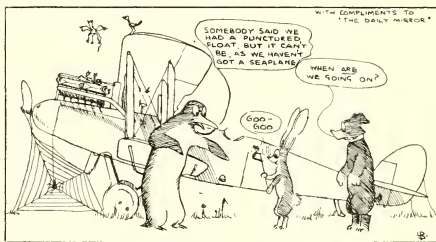
### THE CO-OPTIMISTS' MARK IV.

The fourth new programme of the Co-optimists, produced for the first time at the Palace Theatre on Monday, June 19th, is well up to the standard set by their previous performances. Some of the most successful and popular items of previous programmes are retained, but the greater part of the programme is new.

Miss Elsa Macfarlane has a delightful new song, Mr. Laddie Cliff an heroic ballad of an L.G.O.C. omnibus. Mr. Seymour Hicks' "Man in Dress Clothes" craves as the base for a pot called the "Man in Press Clothes," directed rather at the spirit of *The Times* than at the play.

"Operatic Racing" is as funny as the original "Operatic Golf"—and altogether the show may confidently be recommended to those who need light refreshment which at the same time has a bite about it.

### MAC, BROOME AND WILFRED—V.



### MY DEAR PHOEBE AND GROUND WALKIES.—

The Pets are still having a lovely time at Marseilles but I hear that owing to the long time they have been in France, it is now a month, there is a great shortage of lettuce so I expect they will soon move on.

They took their aeroplane up for a flight last week but came down again as it was not working properly. Wilfred was told that it had a punctured float but he could not make out where the float was. Wilfred is very happy and sings to himself all the time. His favourite song is the one that starts "So I'm going, yes I'm going."

I am still hoping that I shall be alive to greet them when they have flown round the world. People are saying how fortunate it is that they are flying a tractor machine because if it were a pusher their long white beards would get some day tangled in the aircrew.

Anyway we must be thankful that Wilfred is still at Marseilles and every day I hope every day should be getting further and further away, though of course he isn't really.

So there we will, as I always tell you, leave them until next week where perhaps they won't still be 'cos even World Flyers can't stay in one place for ever.

Your affectionate Uncle—G. D.

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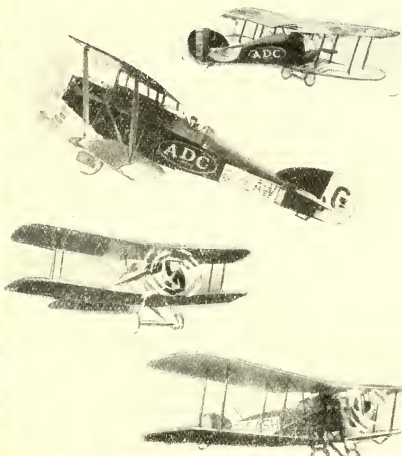


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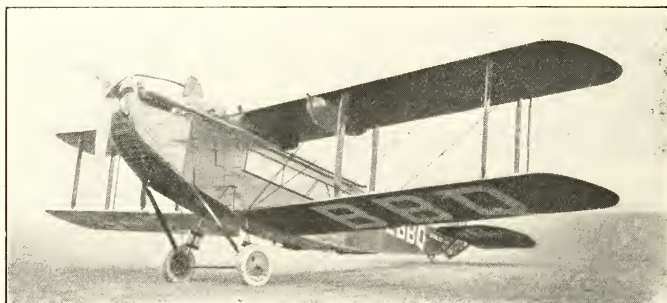
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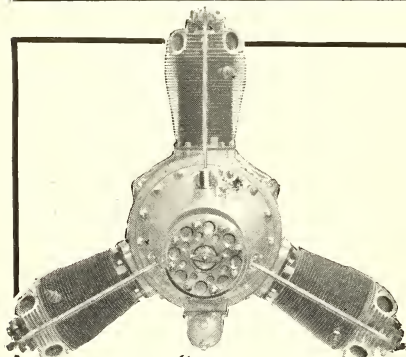


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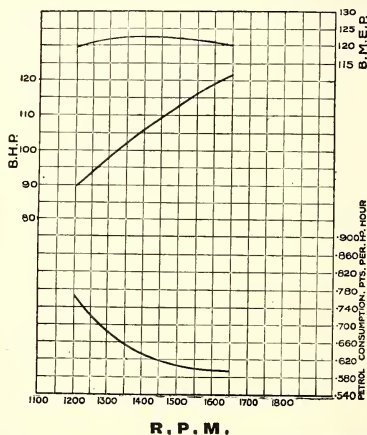


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WEDNESDAY, JUNE 28, 1922.

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G. G. Grey

Vol. XXII. No. 26.

SIXPENCE WEEKLY.

[Registered at the G.P.O.  
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## SIR HENRY WILSON.

On Thursday, June 22nd, Field-Marshal Sir Henry Wilson, M.P., was assassinated by two Irishmen at his own door in Eaton Place. His death deprives the King of a loyal servant and the British Empire of a man who by his mental ability and honesty of purpose might still have done as a civilian work as highly valuable as that which he did as a soldier.

Sir Henry Wilson was no friend to the Royal Air Force as such but none understood better than he the value of aircraft in war. In fact it was his appreciation of the importance of aircraft which made him such a strenuous opponent of the separate Third Service and moved him to work so energetically for the return of army aircraft to the Army. The loss of such an opponent is to be mourned as sincerely as the loss of a friend.

The murder of Sir Henry Wilson will do much to force to a head the settlement for a period of the Irish question. Even Mr. Lloyd George cannot permit murders of such importance to be committed with impunity. The two misguided fanatics who killed Sir Henry Wilson were merely the tools of others and it is those others who must be extirpated if Mr. George is to avoid the appearance of condoning the crime for the sake of his own bodily safety. Actually Mr. George's person is safe enough, for the brains behind the Irish murder gang would never order the assassination of Mr. George for fear lest his successor might form a government which would govern instead of allowing itself to be intimidated.

The blame for Sir Henry Wilson's death should be laid on the English Government rather than on the Irish people, who are in the bulk the easiest people in the world to govern if treated with an intelligent mixture of kindness and severity. If conscription had been enforced in Ireland when it was instituted in Great Britain thousands of the present Irish Republican Army would have become loyal soldiers of the King, and a certain proportion at any rate of the malcon-

tents would have been killed off in the War instead of being left in Ireland to breed rebellion.

After the War when trouble broke out in Ireland it should have been suppressed by troops of the Regular Army with proper pomp and circumstance. Instead of which thousands of hordes of young Irishmen, and women, were driven to exasperation by the bullying and even by the outrages of the irregular troops—known as Auxiliaries and Black-and-Tans—let loose on the wretched country under the Lloyd George-Hammar Greenwood régime.

Properly handled during and after the War Ireland would have been no more troublesome to-day than during the twenty years before the War. To-day there seems to be only one course open to the Government, namely the re-conquest of Ireland. Obviously the Griffith-Collins Government cannot govern Ireland alone. They cannot trust their own troops. Their only chance of remaining in power is to obtain the help of British regular troops to augment the trustworthy section of the Irish Free State Army.

If the present Free State Government does not act in this way then the British Government itself must undertake the pacification of Ireland. In either case it seems that there will be much work for the Royal Air Force, which better than any other Service can do precisely the kind of police-work needed to hunt down the disturbers of Irish peace. When that time comes one asks the R.A.F. to remember that the native Irish will always respect a firm hand and will always appreciate kindness. The Earl of Balfour, then Mr. Arthur Balfour, was the only British official in Ireland during the past forty years who has understood how to mingle the two qualities.

Even if Sir Henry Wilson's death does bring nearer the re-conquest of Ireland the result can never be worth the price we have paid for it. The Empire's loss is greater than the value of Irish peace.—C. G. G.

## ON THE R.A.F. PAGEANT.

Meteorologically speaking the R.A.F. Pageant on Saturday, June 24th, was a wash-out. Financially it was probably less of a success than it would have been if the weather forecasts in the morning had omitted to say "Showery." If the Meteorological Department is going to err it may as well do the job properly for the next Pageant. When there is going to be a wholesale deluge the moral obliquity of prophesying "Fine" is really no greater than that of calling it "Showery," especially when the funds of a great charity are likely to be affected. Even as it was the assistance was large, and if there had to be a wet half-day it was better to have a fine morning and a wet afternoon with a big crowd than to have a wet morning and a fine afternoon with perfect flying weather and no onlookers.

Considered technically as an exhibition of flying the show was better than it has ever been, for all the things which were done at previous Pageants in ideal weather were done on Saturday in pouring rain. Thus the R.A.F. demonstrated that so far from being a fine-weather Service it is not only at home in the air over land and sea but that it is equally capable of performing under water. Which prompted the *bon mot* of one Major Jullerot—the Anglo-French pioneer—who after the big handicap competition asked, "What did you think of the submarine race?"

The Organising Committee, from the Chairman Air Vice-Marshal J. F. A. Higgins downwards, deserve complete congratulations on the way in which everything was run. It did not matter whether there was a lull in the weather or whether a fresh downpour was in full blast, as soon as one event ended another began. There was no lagging and there was never a dull moment. If it did not console people for the weather it did at any rate alleviate their sufferings and the splendid performances of the pilots distracted their attention from soggy shoes and soaked garments.

The proceedings were honoured by the presence of H.R.H. the Duke of York and among the distinguished visitors were Mr. Taft—formerly President of the United States—Lord Weir and Lord Cowdray. Naturally the Secretary and Under-Secretary of State for Air and all the Air Council were also there.

### The Beginning of Things.

The flying actually began about 12.00 hours, with heats of the Relay Race for the Challenge Cup presented by the Duke of York, held for 1921-22 by Kenley. In these Kenley beat Henlow, Manston and Halton in the first heat; Duxford beat Andover, Eastchurch and Hawkinge in the second heat; and Netheravon beat Cranwell and Usbridge in the third heat.

The preliminary heats of the Landing Competition took place early in the morning, some 17 or 18 machines taking part. Unfortunately one missed this entertaining spectacle.

The Pageant itself began punctually at 15.00 hours with the final heat of this competition. Only three Avros took part and there seemed to be little to choose between the skill of the three pilots. All made impeccable contact with the ground. So far as one could see nobody broke anything. And altogether the pure perfection of the performance spoiled it from the spectators' point of view. One had hoped for at least one painless wire-off.

This event was won by F/O. R. H. Daly, D.S.C., D.F.C., of 100 Squadron, Spittlegate, with F/Lt. S. F. A. Day, A.F.C., of Netheravon, second.

Perhaps next year the Committee might arrange a Crashing Competition instead of the Landing Competition. It is in fact just as important for a pilot to know how to crash a machine without hurting himself as to know how to land properly. One remembers that in 1912 or so M. Hélen, the famous Niemport pilot, was given an old monoplane with which to practise crash landings. He rebuilt it himself after

each crash and finally learned how to land on one wing-tip in a tennis court.

Quite seriously though, it would be a very useful way of getting rid of the hundreds of old machines which will be available next year, to let pilots crash them deliberately. Many a good man has been killed by trying to land when a skilful crash would have saved his life. A padded sidest suit and a wired helmet ought to be enough protection against splinters. One offers the suggestion for consideration.

### An Aerial Duet.

After the landing competition came an exhibition of flying by these two very skilful pilots, F/O E. W. S. Bulman, M.C., D.F.C., and F/O E. R. C. Schofield, D.C.M. Seeing that they were mounted on S.E.5's they had little enough chance of showing their skill. The S.E. is essentially a fast fighting machine designed by Mr. Folland for the use of fair average pilots. Consequently it has just enough inherent stability to make it useless for real acrobatic flying. So naturally neither performance compared with Mr. Bulman's last year when mounted on the little B.A.T. which was designed by Mr. Koolhoven to be utterly unstable and completely uncontrollable, as a fighting machine for highly skilful pilots.

Unfortunately the complete failure of the A.B.C. engine (for which it was designed) to be of any use for war purposes prevented the little B.A.T. from being the best fighting machine in the world at the time of the war. And now apparently, it is no longer available even for show purposes.

Still considering their machines, which were designed in 1916 and cannot have been built since 1918, Messrs. Bulman and Schofield put up a very pretty show. The puffy wind and low clouds spoiled the simultaneity of their evolutions but all things considered they were very good.

### A Skysful of Avros.

After them came the Standard Avro Race, in which sixteen or seventeen Avros, belonging to as many stations, filled the sky over the enclosures and chased one another back and forth between Mill Hill School and a mark somewhere Wembley way. Considering that the Standard Avro dates back to 1915 or so and ought to have been replaced by a new type at least three years ago the performance of these hardy annuals in the prevailing wind was quite good, though it struck some of the older pilots that the piloting was hardly up to Gosport form of the Smith-Barry period.

The winner was F/O P. Mergetroyd of Cranwell, formerly a particular star of Kenley. The second was F/O L. Hamilton, D.F.C., of Kenley and the third was F/O V. Beaumont of Henlow. It was quite a good race and the winners deserved to win.

### The Event of the Day.

Thereafter we had what was certainly the most illuminating performance of the afternoon. S/Ldr. Roderick Hill, M.C., A.F.C., on a D.H.10 with two Liberty engines was attacked by F/Lts. Bulman and D. W. Grinnell-Milne, M.C., D.F.C., both on S.E.5's. Now the D.H.10 was not the most successful of Capt. Geoffrey de Havilland's many successful designs. In fact one would not be libelling the machine if one called it distinctly unpopular among such R.A.F. pilots as have flown it, and it is about as agile as an elephant. Still it was when produced in 1917 or early in 1918 the first example of the high-speed more or less manoeuvrable twin-engined bomber, a type which has reached its highest development so far in the Napier engined Boulton and Paul "Bonges," which has the performance of a single-seat fighter with the carrying capacity of a Handley Page.

As an offset against the out-of-dateness of the D.H.10 there was the equal or greater antiquity of the S.E.5's, so that the performance gave a very fair idea of the possibilities of a modern high-speed bomber in a fight with modern single-seaters. The result was highly educative.

So far as one could see never for a moment did the S.E.s get a chance of a shot at the D.H.10. When they tried to attack from behind the D.H.10 merely did a colossal loop which they could not follow for if they tried to loop after it the D.H.10 went up and over and came down behind them. When they tried a side attack or attempted to get below it or dived from above the D.H.10 merely rolled out of the way or did an Immelmann turn and left them in another part of the sky shooting at nothing.

It was a weird sight. Most of the time the D.H.10 was behind the S.E.s instead of in front of them. After the performance our biggest aircraft constructor stated that if one went down to the machine park one could tell the two S.E. pilots from all the rest by the fact that their necks were twisted like corkscrews through looking round for the D.H.10.

On another page Mr. Bridgman has illustrated the event.

Even granting that only a very able pilot could throw a big twin-engined machine about as S/Ldr. Hill did, it showed what could be done with the type. And what the specialist pilot can do to-day the average pilot can do to-morrow if adequately trained for the work.

It is evident that one of the needs of the near future for the R.A.F. is a kind of Gosport Course in flying big twin-engined machines. And this in its turn means the design and construction of a twin-engined school machine which will be to the pilots of big machines what the standard Avro is to pilots of single-seaters and reconnaissance machines. The Training Department of the R.A.F. will do well to consider the question.

### A Matter of Engines.

Naturally a big machine cannot thus be flung about in the air by the use of the ordinary controls. Each engine in turn has to be throttled down or opened up to pull the machine into or out of the extraordinary positions it assumes. And the use of the engine controls in conjunction with the ordinary controls must need quite a deal of practice besides mere coolness and presence of mind. In addition to which pilots would need to be taught what to do if one engine or other stopped suddenly in the middle of a manoeuvre.

Apologies which, S/Ldr. Hill when arriving in the morning had to get into the aerodrome with the engines switched off. Some miles from Hendon the throttle-rod of one engine unslipped itself through a bolt sawing through its split-pin and coming out with the result that the engine dropped to 800 r.p.m. and would do neither more nor less. It was possible to keep in the air with one engine doing 800 r.p.m. but not to land, so the only thing to do was a switched-off landing, which is by no means easy on this particular type.

Altogether there was much to be learned from this event and one hopes that none of the lessons were lost on those responsible for the operations and equipment of the R.A.F.

### A Menagerie Race.

At 15.45 came another interesting event, a handicap race in which the competitors included a Sopwith "Snipe," the new Avro bomber (known as the "Aldershot") with a "Condor" Rolls-Royce engine, a Westland "Weasel" with a Bristol "Jupiter" engine, a "Weasel" with a Siddeley "Jaguar" engine, a Sopwith "Pup," a "Buzzard," a D.H.9a, with a "Liberty" engine, a D.H.9a, with a Napier "Lion," an S.E.5a, a Bristol Fighter with a "Falcon" Rolls-Royce, a Vickers "Vimy" with two "Bagle" Rolls-Royces, and a standard Avro. The rain came down in torrents during this race, hence the "submarine" joke.

The winner was F/O C. E. Horrex on the "Aldershot" Avro, which was said to have put up a speed of 115 m.p.h., quite a good pace for a heavy bomber, especially when one considers that it has one of the early "Condors," which gives about 150 H.P. less than is expected from the engine in its final state of development. The second was F/O Walwork, M.C., on the "Jaguar" Weasel and the third F/Lt. A. H. Orlebar, A.F.C., on the "Jupiter" Weasel. This result was particularly instructive.

In the first place the "Aldershot"—which was not attributed to the Avro firm in the programme—is the latest product of the Aircraft Industry to be seen in public. In fact she is the first Avro product since the standard training machine which seems likely to be standardised by the Air Ministry. During the War the firm produced several excellent machines but none were ever put into production. Another "Aldershot" is to be built with a 1,000 h.p. Napier "Club," so the old firm looks like coming into its own again.

Secondly the Westland "Weasels" showed how good they are in spite of the way they have been neglected since they first appeared several years ago. There is some talk of their becoming the R.A.F.'s standard two-seater fighter. If so one can only hope that before they are put into production the Westland Co. will have a chance of bringing their design up to date. They are quite good, but after all they are several years old and the firm's design staff must have had several new brain-waves since the "Weasel" was the latest child of their intellects.

One pilot in this race—one could not be sure of his machine at the distance—saved a collision with the palings if not with the public by sheer clever handling. Just as he was getting off his engine stopped and he had to make a "bump" landing in front of the crowd. Happily no harm was done.

### The Smoke Fiend.

Event No. 6 was to be a demonstration of "writing in the sky and formation of coloured smoke clouds, showing how machines making trails of smoke form 'writing in the sky.'" The programme also said "Another machine will demonstrate how coloured smoke clouds may be utilised to signal from a considerable distance to the aerodrome or to other machines in the air." This was washed out by the Committee to save it from being washed out by the rain.

There seems to be some argument about who started this writing-in-the-sky business. At present Major Jack Savage claims the honour. As the business grows, as it certainly will when general trade improves and enterprising pill and

salts and oil merchants cloud the air with their obscene advertisements, Major Savage will probably grow a beard, even if he does not in other respects follow Mr. Bevan's lead and flee the country, for probably the hired gunmen of the Brighter London Society will be seeking his blood. And apropos this, compliments to *Punch*—as usual "in the movement"—on the picture of the old lady who seeing sky-writing for the first time ran for her husband shouting, "Johu, come and look. Here's one of them wireless messages caught fire."

As to signalling by coloured smoke, why go to the trouble of carrying smoke-making apparatus when wireless telephones are so cheap and handy and so many people are colour-blind. One of the best brigade commanders the R.A.F. ever had would be thoroughly defeated by this method of signalling.

### Formation Extraordinary.

Event No. 7, at 16.10 hours, was an exhibition of formation flying by nine Bristol Fighters (Rolls-Royce "Falcon" engines) from Kenley. The pilots were S/Ldr. E. H. Johnston, O.B.E., F/Lts. J. M. Robb, D.F.C., F. L. Luxmore, F/Os. R. W. Chappell, M.C., M. L. T. Leroy, A.F.C., N. H. Jenkins, D.F.C., D.S.M., L. Hamilton, D.F.C., T. C. Traill, D.F.C., and G. S. Oddie, D.F.C., many of whom took part in last year's demonstration under the same skilled leader. This year the flying was even more remarkable than last year for when the machines divided into their three groups one group or other frequently disappeared into the low clouds and yet always appeared out of the clouds in the right place.

Owing to the gustiness of the strong wind machines were lumped right out of position yet they got back into place in remarkably quick time. The get-off in formation was particularly good though the landing was less perfect than previously owing to the machines on the port wing of the formation being so much blown about when coming in over the railway bank.

It is to be hoped that by this time next year the formation flying may be done by something new in the way of machines. The Bristol Fighter was designed in 1916, and the first flight of them that ever crossed the lines (on Good Friday, 1917) was shot down by the Germans, all except one machine. Afterwards, when properly handled, it proved to be the finest two-seater fighter in the world. And there never has been a handsomer machine or one which pilots loved better than this product of Capt. Frank Barnwell's genius. Put it is over six years old and it is time we had something fresh.

### Comic Relief.

Event No. 8 was an exhibition of crazy flying by F/Lt. W. H. Longton, D.F.C., A.F.C., on an Avro which had apparently been painted and decorated by an habitu  of Parisian caf s or London night-clubs. Unfortunately his best efforts could only be seen at close quarters. On the other hand happily Mr. Longton's work was best seen at a distance. This style of flying originated, in public at any rate, with F/Lt. Noakes, but Mr. Longton has improved on the original. Nothing more horrific has been seen than his sharp turns banked the wrong way and his cornwise nose dives. His maintenance in the air can only be explained by the Einstein Theory, for one would defy the whole Advisory Committee

for Aeronautics supported by the serried ranks of the aerodynamic experts and wind-tunnel crystal-gazers of the N.P.L. to explain him scientifically. Presumably he is flying relatively to something or other, but gravity and the resultant wind and drag and lift must get pretty badly twisted in the process. He is in fact a complete aerial Chamber of Horrors.

### Low Bombing.

The programme, describing Event No. 9, "Low Bombing" said "Four Sopwith 'Snipes' will each drop three practice bombs on a temporarily disabled tank lying on the aerodrome." As a matter of fact they did not. But they dropped them quite near enough to have made things very unpleasant for the tank if the bombs had been I.N.T. instead of the "pop and puff" variety. What one did not quite like was the way in which some of the machines in circling to approach flew towards the crowd before turning and so came into a position from which if a bomb had fallen off its rack it might easily have dropped into the crowd. Even a practice bomb would hurt if it scored a direct hit on a person's head. R.A.F. bomb-gear is not quite so infallible as the decisions of the experts of the Technical Department.

Nevertheless it was quite a pretty show and the pilots concerned—F/Lt. E. L. Howard Williams, M.C., and F/Os H. E. Walker, M.C., D.F.C., C. E. Maitland, D.F.C., and F/O Travers, D.F.C., from 23 Squadron at Hawkinge—deserve commendation for their handling of their antiquated aircraft. Incidentally one of them picked up a huge divot of turf on his tail-skid and shock it off as he crossed the sheds by Colindale Avenue. Several people thought that a bomb had fallen off, but a bystander with a keen eye and a passion for golf recognised the missile—doubtless as the result of personal experience—and remarked, "I wonder whether the Grahame White Company will insist on these chaps replacing the divots?"

The competition in connection with this event was won by Mr. Travers, with Mr. Williams second.

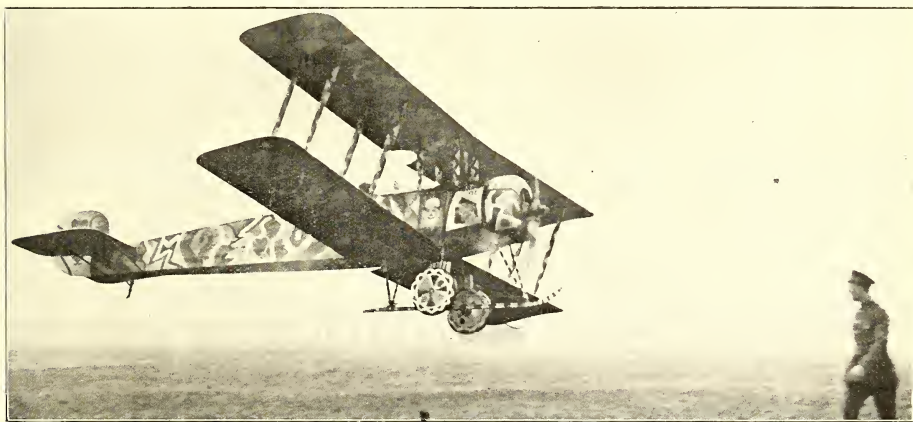
### The Triumph of Organisation.

At 16.45 hours came the final of the Relay Race, when the present holders of the Duke of York's Cup—No. 24 Squadron at Kenley—beat Halton and Duxford. The Kenley team—consisting of F/Lt. R. W. Chapman, M.C. (Avro), F/Lt. J. M. Robb, D.F.C. (Bristol), and F/Lt. F. Luxmore (Snipe)—scored as much by the excellence of their mechanics as by their piloting. Every engine started at the first pull over and answered instantly when the throttle was opened. The piloting was excellent, especially the landings.

Kenley has always been rather a star turn station and apparently it is maintaining its reputation. Possibly the excellence of the pilots is partly explained by the abominable surroundings of the aerodrome, which have probably caused more deaths than those of any other aerodrome in England. By a process of elimination if a man cannot fly well at Kenley he soon ceases to fly at all.

### The Immobile Novelties.

Event No. 11 was to have exhibited the types of machines now used to operate—and it is hoped some day to co-operate—with the Navy. There were two Blackburn "Dart"



THE CRAZY AVRO: A snapshot of F/Lt. Longton disporting himself near the ground.



torpedo-droppers, and a Parnall "Puffin" float amphibian all with Napier "Lions" in the machine park, but none of them were flown. Presumably the Authorities considered that as they are intended for use over and on the water they should not be used when the water was uppermost. It was rather a pity as a good many people would have liked to see the "Dart" and the "Puffin" in the air.

The Supermarine "Seal" boat amphibian was billed to appear, but she broke a charger-pipe of her self-starter gear when flying up from Grain on Friday and had to descend on the Thames, whence she was towed back to Grain and was not repaired in time to get to Hendon. The stories current on Friday that she was lying in the Thames with connecting rods sticking out all over her hull, and so forth, are pure fabrications.

Just why the Fairies "Pintail" was not put into the programme one cannot explain. She was the first successful amphibian, she is the only amphibian with fixed landing wheels instead of retracting gear, and she is the only one with variable camber wings, so she represents the full extent of modern progress. Probably she was left out because there are too many interesting things about her.

### The Poetry of Motion.

Event No. 12 was another display of flying by Mr. Longton. This time he was serious and proceeded to show on a Sopwith "Canal" (of 1916 vintage or thereabouts) just what an aeroplane can do when handled by an artist. He performed quite as much in the clouds as out of them and when he was out of the clouds he was in rain nearly as thick as the clouds so people wondered how he could see what he was doing.

The "Canal" aeroplane is nearly as tricky a beast as its quadruped namesake, and it must be a trifle difficult to perform accurately on a machine in which when doing a left turn one uses full right rudder and does the turn with the elevator. Still some people like both kinds of camel. Anyhow Mr. Longton knows how to manage the winged species. His slow rolls and loops are as neat as ever and his upside-down flying seemed better even than usual.

One hopes next year to see him displaying his skill on a modern aeroplane with a modern engine. And incidentally it is quite time somebody set to work and designed a single-seat fighter according to modern ideas.

### An Event that Was Not.

The attack on a formation of three "Vimy's" by the "Snipe" formation from the Central Flying School which was to have been Event 13 was washed out chiefly because a great deal of height was necessary to get the proper effect. One of the "Snipe" was to be shot down in flames entirely out of control. Those who saw the show in practice say that the particular pilot who was to have done it is an artist at this job.

Also, S/Ldr. J. G. T. Fall, D.S.C., A.F.C., who was to have led the formation had the misfortune one day last week to slip when starting an engine and be caught a whack on the head by the airscrew. He was only unconscious for a few minutes and was able to take notice, if not sit up, the day after, but naturally he could not fly, which rather spoilt the formation.

It was a great pity this event was cancelled, as the "archie" guns and "archie" bursts round the bombers and all the rest of the tamasha would have been excellent fun for the spectators.

### Major Sandbags Again.

Event No. 14, "featured" the familiar shooting down of a kite balloon from which the famous Major Sandbags,

O.B.E., annually escapes by parachute. This year the event went better than usual for the blazing balloon shone fiercely against the black clouds and really brought back the horrors of war.

The C.F.S. "Snipe" formation which did the deed consisted of F/Lts. T. F. N. Gerrard, D.S.C., and B. McEntegart, and F/Os. W. E. G. Mann, D.F.C., R. C. B. Brading, D.F.C., and H. L. P. Lester. Their get-off and landing in formation were excellent. When aloft Mr. Gerrard separated from the rest and attacked the balloon while the rest circled round to protect him from hostile aircraft. As the clouds were at about 300 feet, trench-strafing to keep down rifle fire would have been more to the point.

Still the show went very well, and to add to the excitement Major Sandbags landed awkwardly in a tree. One is not quite sure whether this cancels his previous O.B.E. or whether it was a permissible hazard. Anyhow, as honours are so easy to obtain in these days one may assume that he gets a second bar to his O.B.E.

Incidentally one hears that "Snipe" are no longer approved for the species of flying displayed on them last year. queer things have happened to some of them owing to old age and probable deterioration of material, so nothing more than ordinary flying is now permitted on them. Personally one is of the opinion that every machine built prior to 1919 ought to be scrapped.

### International Complications.

At 7.55 came the "set piece" of the Pageant, the attack on the Desert Stronghold, (*vide* small hand-bills). Here one fears that the Organising Committee—or more possibly the Air Council—were misled by their kindness of heart, and descended from one pitfall into a deeper one.

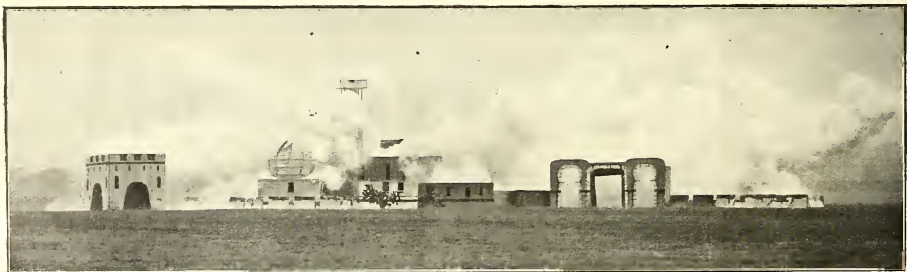
As stated some time ago the original desire of the R.A.F. was to bomb a battleship, just by way of showing the Navy what is what, as it were. This joyous display was ruled out of order for fear of hurting the feelings of the Navy, which every day and in every way is getting touchier and touchier about air attacks, especially since the chief frightfulness specialist of the R.A.F. put two successive bombs—fortunately dummies—down the funnels of *H.M.S. Agamemnon* from 8,000 feet when she was steaming at 10 knots, and added insult to injury by sticking a third bomb into a funnel-casing.

Therefore the Desert Stronghold was invented as a substitute for the battleship. But the inventor and the approvers apparently forget that the British Empire is the greatest Mahometan power in the World, and that several tens of millions of our Syrian and Davidian fellow-subjects all over the world would be deeply grieved and possibly gravely incensed at the wanton insult which a mock attack on a desert stronghold, complete with mosques as fitted, would represent to them.

It will be remembered that a very Christian padre at Hawkinge Pageant last year forbade with bell book and candle, or at rate asked civilly for the cancellation of, the burning of the imitation church with its Handley Page fuselage spire in the imitation German village. How much the more therefore ought we to consider the feelings of our dark-skinned brethren in the overseas Dominions?

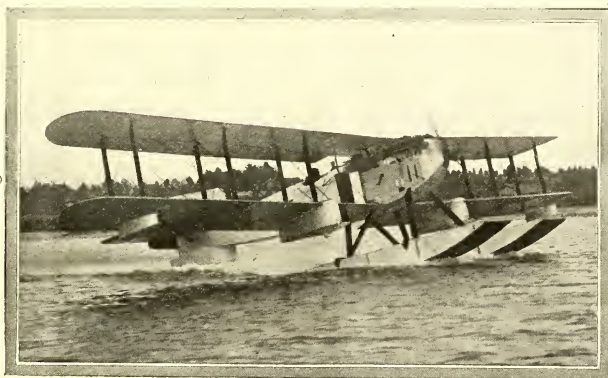
Merely to spare the feelings of our obsolete Navy we have perhaps cut to the heart our Moplah and Ghandist compatriots. It is a terrible thought. It is worse than the insult offered to the Jews by that insensate fellow who dared to win a race with a horse called "Pogrom" (*vide* daily press for account of race and of Jewish feelings on the subject).

Obviously the error might have been remedied, even after the village had been erected, by informing the press that this



AN INTERNATIONAL COMPLICATION: The "Desert Stronghold" in the act of being bombed. The Internationalism of its architectural style suggested Bolshevism in the Architect's Profession.

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was not a Mahometan stronghold but was in fact an exact replica of the capital city of the Soviet Republic of Azerbaijan in the Caucasus. As Captain Savers remarked, the architecture (which was the work of some "movie" artist or other) was distinctly Krenlinesque, and besides the Press will swallow anything if it has a heart interest, and anyway nobody knows whether the architecture of Azerbaijan is Perso-Moorish, or Carpenters' Gothic like Golders Green, or Sanitary Inspectors' Renaissance like the R.A.F. Club.

But even then the Committee or the Air Council might have got into trouble, for the Soviet of Azerbaijan might have raised a row through Mr. Lloyd George's friends from Moscow and have got them to forbid Mr. George to touch the bursting cornbins of Russia on which he set such longing eyes—before we were asked to subscribe to support Russians stricken by famine as the result of their betrayal of the Allies during the war. Or they might have persuaded the Moscow bureaucrats not to pay over to our tradespeople the blood-stained gold and jewellery they have stolen from murdered aristocrats and clergy.

Perhaps after all if the R.A.F. authorities wanted to be quite sure about not offending anybody who mattered the best thing they could have done would have been to have given a representation of the Irish Republican Air Force bombing Belfast City Hall, with the statue of Queen Victoria in front. The only people who would have minded would have been a few loyalists. They cut no ice and pull no graft with the present Government.

One genius suggested that the real reason for not bombing a dummy battleship was that if the R.A.F. had destroyed it the Admiralty would certainly have put an extra £9,000,000 into the next Naval Estimates to replace it.

One is informed that Mr. Oscar Asche was *not* the "producer" of the Stronghold scene, despite its likeness to Cairo.

### The Finale.

However, the village was duly bombed by the Kenley Bristols and the armoured cars rushed round and machine-gunned funny fellows in flowing robes who rushed out from the bombed city, which smouldered drearily in the driving rain—a few experienced Irish incendiaries ought to have been engaged to get the fire going as they are used to burning green stuff, or perhaps some demobilised Black-and-Tans would have done as well after the affair at Cork. The "archie" guns opened with vigour, but whether at the aeroplanes or at the city one could not be quite sure. There was

much noise and smoke and steam and rain, and everybody was thoroughly jolly.

After that the band played God Save the King while S/Ldr. J. K. Wells and F/Lt. C. H. Rea, A.F.C., put up a smoke screen which must have acted like a gas attack on the people along the railway bank. Personally one thinks that these smoke screens ought to be put up at intervals, so long as the wind is in the west, so as to blot out the people who steal free views from Hendon Hill. Thus they might be persuaded to come into the aerodrome and pay up for the R.A.F. Memorial Fund like perfect little gentfolk.

### The Photographic Competition.

During the day sundry photographic machines from various stations flew round on their deadly missions. Some of the results were shown in the public enclosures so soon afterwards that it seemed as if the plates must have been developed on board with hot water from the radiators.

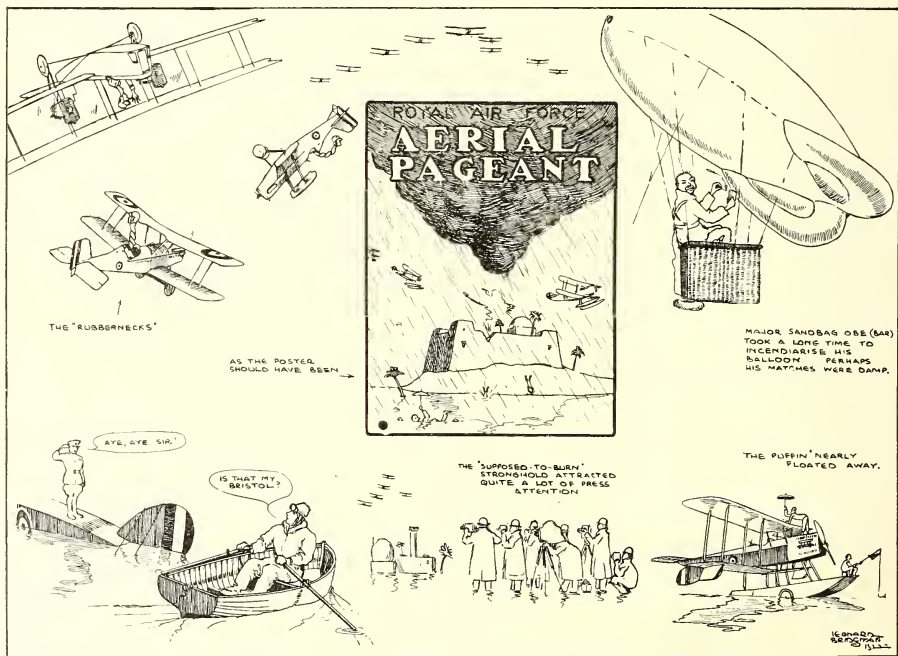
The result of the competition was made known on Monday, when F/O. E. H. Allen, D.F.C., of Duxford, was declared the winner with F/O. V. E. Groom, D.F.C., of the School of Photography second.

Incidentally sundry civilian machines which were "joy-riding" were a nuisance, taking off low over the crowd, and distracting attention from the serious events.

### The Cheerful Pessimists.

The most endearing quality about the Englishman, as usual embracing woman, is his or her capacity for being cheerful under hostile circumstances. It was the same quality which defeated the German Army—even if we may not say that we won the war, which is one believes the privilege of the United States of America. That quality was strongly in evidence on Saturday. People damned the weather heartily but they were remarkably cheerful towards each other. Some even succeeded in being witty, as for example the aircraft constructor who was asked by an ignoramus what was the difference between the D.F.C. and the A.F.C., so frequently mentioned in the programme. He replied, "The D.F.C. is given for flying in the face of the enemy. The A.F.C. is given for flying in the face of Providence." Which is much more apt than the official explanation that the Air Force Cross is given for dangerous flying, such as testing new or experimental machines or making flights over dangerous country, in time of peace or not actually in the tactical war area.

On the whole even the wettest of those present seemed to



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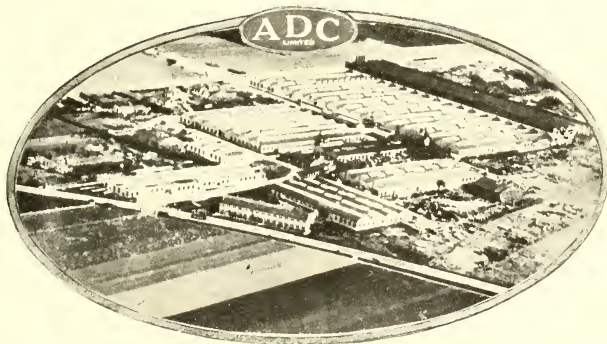
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enjoy themselves, and everybody was unanimous in praise of the way in which the R.A.F. carried the show through in defiance of the weather. It will react in favour of future Pageants, for everybody now knows that no matter what the weather the R.A.F. will put up a show and so nobody will stop away for fear of there being nothing to see. All the same one wishes the Pageant Committee better luck next time and one hopes that the gate this time has proved sufficient to cover expenses and show a handsome profit.—C. G. G.

### IMPRESSIONS OF THE PAGEANT.

In order to save time and avoid the crowds one decided this year to go to the Pageant by air. As for various reasons one was unable to leave London until 13.00 hrs. one took the precaution to book a Royal Aero Club Avro a month previously and went to much trouble to ask that it should be ready to start up at 14.30 hours. Punctually at 14.45 hours it was brought out of its shed and by 15.10 hours it was round at the front being filled with petrol, and sharp at 15.20 hours it was ready to start!!!

Mr. Olley, of the Handley Page Transport, very kindly at the last moment came as pilot and the weather was vile good and viler still coming back. We made Hendon in eight minutes when the show had been going for about half an hour.

In every Pageant there is always one turn of actual flying which is better than anything of the previous year which one would never have seen without seeing. Last year it was F/Lt. Noakes' Crazy flying. This year it was S/Ldr. Rodrick Hill's performance on the D.H.10a. No wonder Squadron Leader Hill says he thinks flying so dangerous when he speaks in public or reads papers, and doubtless it is when he has a big twin-engined bomber in curious positions that he draws some of those "peeps into the future" pictures which appear in the Press from time to time.

### THE R.A.F. GATHERING.

The R.A.F. Gathering on the eve of the Pageant may be written down as a genuine success. On Monday the hard-working Secretary wore a long face, for only 20 tickets had been bought for the Officers' Dinner and it was evident that the "Other Ranks" Dinner would have to be washed out owing to lack of diners, although applications for information had been coming into Room 651 at the Air Ministry at the rate of 20 to 30 a day for over a fortnight.

On the Wednesday night the Secretary looked a little brighter for 80 tickets had been sold for the Officers' Dinner. Greatly daring he ventured on the strength of this to ask Air Vice-Marshal Sir Geoffrey Salmond, Director-General of Supply and Research, to take the Chair, which that officer consented to do, as befitted a sportsman who was in one of the famous "First Four Squadrans."

By 10.00 hours on Friday evening 200 tickets had been sold, and at 20.00 hours 121 post and pre-war officers of the R.A.F. sat down to dinner, the biggest gathering yet held of R.A.F. Officers. It was certainly astonishing to find the attendance increasing by 50 per cent. in the hour before dinner, but the management of the Connaught Rooms rose to the occasion and everybody was thoroughly satisfied.

The half-hour in the ante-room before dinner well repaid the organisers of the Gathering for their work and anxiety. It was positively affecting to see people running about the room greeting friends whom they had not met for years, and in some cases making up old differences or misunderstandings. Certainly one has never seen a cheerier crowd. It was by no means an occasion with important speeches by big bugs in the ofing, it was just a gathering of R.A.F. pilots for their own edification.

At dinner the old Home Defence (Sixth) Brigade had a long table to themselves with their Commander, Group Captain T. C. R. Higgins at the head, and they duly impressed on the rest that they were the biggest unit, which was not fair, as they were really quite a lot of units. Little groups from other units occupied other separate tables and the odd men whose pet units had no local habitation always managed to find friends.

During Dinner the R.A.F. String Band from Uxbridge played excellently. The members deserve special thanks as they do come voluntarily and without fee.

After dinner Sir Geoffrey Salmond having given the toast of the King in due form and having paid tribute to the memory of Sir Henry Wilson proposed that an R.A.F. Dinner Club be formed there and then. The proposal was received with acclamation and after dinner something like 200 of those present duly signed on. Those who omitted to do so then had better write to the Secretary at Room 651 at the Air Ministry and ask for forms, for the R.A.F. Dinner Club is now a real live organisation and will do much bigger things next year.

Flight Lieutenant Robeson, the Hon. Secretary, described how Wing Commander Christie, now our Air Attaché at

One hopes that next year he will roll a Handley Page 0/400 or a D.H.34 with the Air Council aboard.

Major Sandbags seemed thoroughly peeved by the shooting of the Snipes at his sausage balloon and having seen that the balloon refused to ignite after three efforts he preferred to remain no longer in such unsporting company and left hurriedly *en parachute*. Seeing this deliberate slight the sausage promptly lit up and followed the gallant major.

The desert stronghold, or what Mr. S. P. B. Mais called Tel-el-Hendon also suffered from dampness of spirits and refused to burn as a good pageantial desert stronghold should. At any rate the flames never got a strong hold.

At 18.15 hours we bled us to our Avro and spent a merry half hour very kindly assisted by an excellent sergeant of the R.A.F. and others trying to swing the prop. However with the assistance of a doper she was eventually started and with the vast majority of the cylinders firing occasionally we pushed off into the rain and filth.

One noticed a huge block of cars trying to get away from the aerodrome and was comforted to know that they were experiencing just as filthy weather but we should be home in about twenty minutes while they would be an hour at the least.

Visibility was about an eighth of a verst or less and over Cricklewood the engine started banging and spluttering. It picked up again however and Mr. Olley wisely decided to get away from the London area and followed a route to Croydon where forced landings would have been possible at any time. We reached Croydon in exactly twenty minutes after an exceedingly nasty trip, wet through to the skin. It was by no means Avro weather and many people would have hesitated to bring the machine through at all. Mr. Olley deserves much praise and thanks for the effort. One hopes however that the Club Avros will not in future be sent out without dopers, as the difficulty in starting them up gives onlookers a bad impression.—G. D.

Washington, had formed the Committee which organised the Gathering, and he then outlined the general idea of the Club, to assure not merely the continuance but the increase in size and importance of these gatherings.

The famous Doctor Swann, founder of R.F.C. hospitals, who was dining with the Sixth Brigade, was pushed onto his feet and remarked bashfully that as the first P.M.O. of the R.F.C. he thought he had better come and look after them. He said that he had had 9,000 R.F.C. officers through his hands and he was glad to see so many had survived. (One has said that there were 150 there.) Then he told them various things that were good for their health, and sat down amid tumult.

Then Group Capt. Higgins proposed the health of the Chairman, Sir Geoffrey Salmond, which was sung with vigour. Then S/Ldr. Thompson proposed the O.C. Sixth Brigade, which was received with enthusiasm and thereafter people broke up into little groups and wandered from one group to another discoursing on all things on earth and off it till midnight. The clamour of many voices made conversation difficult, which in turn produced thirst, which thirst was duly assuaged so long as the law allowed, and nobody seemed much the worse. One doubts whether the results would have been at all regrettable even if the law in the Kingsway area permitted one to be thirsty after 23.00 hours as it does further West.

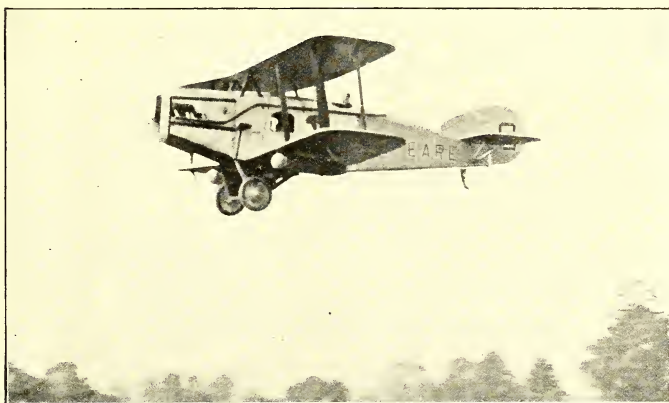
Altogether the evening was a huge success and reflects the greatest credit on the Secretary and his Committee. The credit is all the greater in that the affair was run on a shoestring without funds. Stamps and paper were paid for out of the private pockets of the organisers and no money was available for advertising.

It must be said that the daily and weekly newspapers supported the project most generously. The preliminary and "follow-up" paragraphs were published by all the leading papers and some even made paragraphs out of them for their "gossip" columns.

Undoubtedly hundreds of other officers would have turned up at the dinner if they had known it was going to be a success, but seeing it was a new thing they felt doubtful about it. Next year there need be no such doubt. The R.A.F. Dinner Club now has funds in hand which will enable it to do much better next time, when it is hoped that all who were present on Friday will come and bring at least one other R.A.F. officer who was not at this first dinner.

The following units held dinners elsewhere on the same night:—No. 8 Squadron (in another department of the Connaught Rooms), No. 20 Squadron (at the Holborn), No. 4 Squadron (at the Savoy), Nos. 276, 11, and 12 (at the Cecil), Nos. 80 and 47 (at Princess), No. 1 Balloon Base (at the Griffin) and No. 5 Seaplane Base (at Gatti's).

Next year all ought to get together and hold one big dinner on the eve of the Pageant just to show what the R.A.F. can do when it wants to if it tries.—C. G. G.

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### THE WEEKLY COMMENTARY.

An attempt has been made in an article below to consider the question of safety in the air on the broadest possible lines, in order that the nature of the dangers encountered in flying may be realised clearly and the conditions which make for safety or the reverse may be seen in true perspective quite apart from specific cases of particular accidents or particular conditions.

It is thought that this article shows that danger in flying is purely relative, and that safety is to be attained not by any one improvement either in machines or in organisation but by the proper choice of organisation and route to suit the qualities of the machines available—and *vice versa*.

It follows that if with present machines and present organisation certain routes are not sufficiently safe for commercial operation it is not necessary to wait for improved machines and improved organisation if one can find other routes where the conditions will allow of safe operation with existing material.

The very remarkable story which has been circulated in explanation of the Spad crash in the Channel on June 3rd last is given in this issue in greater detail and with more circumstance than has been possible in any other papers up to date.

### SAFETY IN THE AIR.

So much has been written—especially during the past few weeks—upon the subject of Safety in the Air, and what has been written has been directed from so many points of view that there is a serious risk that the impression may be produced either that the problems are so complex as to be insoluble—or that they are only to be solved by the use of some specific cure for one particular evil.

There seems to be some need for an ordered consideration of the dangers of flying, in order that they may be set out and classified. The real nature of the difficulties can thus be made clear and the methods which are available to reduce the dangers can be indicated in a general way, and the problems thus encountered can be considered apart from specific instances of accident.

Any flight may be divided up into three stages—(i) Getting off from the starting point (ii) The flight proper (iii) Landing at the destination. Danger may arise during any of the three stages. Certain of the stages have their specific varieties of danger.

#### DANGERS OF "GETTING OFF."

Getting off involves dangers due to the fact that during the whole period from leaving the ground until the attainment of a height which is definite only for a particular machine and a particular set of ground and weather conditions the machine is too close to the ground to give the pilot freedom of manoeuvre. These dangers are in no way different in essence from the dangers which may arise under any other conditions of insufficient height, but are often aggravated by the fact that during this particular period the machine is flying at a low speed in the effort to gain height. This has the effect of reducing the manoeuvrability of the machine and of restricting the pilot's choice of alighting ground in the event of engine failure, or other emergency.

The factor concerned in this specific danger is the size of unobstructed aerodrome surface, relatively to the machine's getting off performance. If the aerodrome is so big that a given machine can stop its engine and glide straight ahead to a safe landing at any point up to that of a height sufficient to allow of safe turn back this specific danger disappears.

Safety in regard to this matter may be attained therefore either by the use of very large aerodromes or by developing machines with a very short "get off" run and a very steep and rapid climb.

#### LANDING DANGERS.

Landing at the terminal has so far as one can discover no dangers which may not be met with in the event of a forced landing en route and separate consideration of this stage may therefore be omitted.

With very few exceptions all the dangers of flying are dangers due to the possibility of violent collision with the earth, or some obstacle on it, and as a terminal aerodrome

is supposedly organised to facilitate the making of a smooth and gentle contact with the surface no danger should exist there which may not exist in even more aggravated form elsewhere. The only possible exception is that of the greater likelihood of collision with other aircraft on or over an aerodrome, owing to the concentration of air traffic which may occur there.

#### A BROAD CLASSIFICATION.

The general dangers which arise may be divided into two main classes, those resulting from—

(A) accidents which cause the aeroplane to become either completely or partially out of control; and

(B) accidents which force a descent, but which leave the machine otherwise completely under the pilot's control.

Under (A) come such incidents as the breakage in the air of vital parts of the control or supporting organs of the machine. This particular type of accident is now extremely rare. Experience has shown with fair certainty what loads are likely to be experienced by an aeroplane in flight, and how strong the aeroplane must be to withstand them. The aeroplane structure can be, and almost invariably is, very completely duplicated in regard to its vital stress carrying members. No important member is likely to break in flight without attracting the pilot's notice, and thanks to the usual duplication of members it is nearly always possible for him to keep the machine in control and to fly in a manner which shall not impose any severe strains on the weakened structure until he can discover a safe landing ground.

The actual risks of breakage in the air as the result of flying stresses are so small as to be negligible even now. Breakages in the air will occur always—but the modern aeroplane is as safe in this respect as any transport vehicle now existing.

#### FIRE IN THE AIR.

Another risk of this class is that of fire in the air. Fire may either damage the structure so seriously as to cause failure of some vital part—or it may render the pilot physically and mentally incapable of retaining control. By careful installation of engine and fuel systems, the risk of an outbreak of fire in the air has been reduced to very small proportions. Also by known methods it can be ensured that such a fire shall either be strictly localized, or shall spread so slowly that it is extremely unlikely that a landing shall become impossible.

There remain in this class accidents due to collision in flight, and to physical or mental failure of the pilot. Collision ought to be a negligible risk—it is not in fact a serious risk. It can be reduced by care in the design of machines to secure for the pilot the best possible view,—and by proper traffic control. The greatest collision risk

occurs under conditions of bad visibility, and for so long as pilots have to fly close to the ground in mist or under low cloud, and find their way by observation of the surface this risk will continue. It should disappear as soon as it becomes possible safely to fly over fog or clouds.

#### FAILURE OF PILOTS.

Failure of the pilot should not be a serious risk under peace conditions. There is no evidence of any kind that it is serious. Naturally care is necessary in the selection of pilots, and medical examination at intervals is essential. There do not seem to be any grounds for suggesting that the work of a civil aeroplane pilot exposes him to any risk of sudden failure greater than that incurred by the driver of a heavy motor vehicle. Nor are the dangers resulting from such a failure immensely greater than those which might result from the sudden collapse of an L.G.O.C. bus driver in a busy thoroughfare. The provision on all civil aircraft of two pilots would undoubtedly reduce such risk as there is, but it is very questionable whether this precaution is at all necessary.

#### FORCED LANDINGS.

Accidents of Class B—forced descent under control, are the most common source of danger encountered in practice. Almost invariably they are due to engine or engine installation failures.

Forced landings are unfortunately far more frequent than one would wish.

Power plant failures are much more common than any other accident mainly because of the complicated nature of the mechanism involved, and the impossibility of any such duplication of vital members as can be and is attained in the structure of the aeroplane proper. Power plant failures will never disappear—no mechanical device can conceivably be made perfect—but there is good reason to hope that they may become steadily less and less frequent. But in any case it may be many years before the risk of engine stoppage is as small as the risk of failure of the aeroplane structure to-day.

#### THE CONDITIONS FOR SAFETY.

Fortunately the safety of flight does not necessarily depend upon the perfection of the engine and its accessories. There is not necessarily any danger attached to a forced landing under control. If at the moment of engine stoppage there is within gliding reach a landing ground of adequate size, and if the pilot can find his way to that ground, there is no more risk in a forced landing than there is in a voluntary one.

The adequacy of any given piece of earth as a landing ground is governed by the qualities of the aeroplane which is to use it. Generally speaking, the lower the landing speed of the aeroplane, and the quicker it pulls up after landing the smaller and the rougher an "adequate ground" will be. These qualities in the aeroplane add to safety by multiplying the number of "adequate grounds" over any given route—which tends to secure more and more certainty that such a ground shall always be within reach.

With any given distance between successive landing grounds the requisite that one of them shall always be within gliding reach can be attained by the aeroplane itself flying at a sufficient height. Generally the better the aeroplane—in the matter of gliding angle—the further apart the grounds may be. And over any but very bad routes it is usually possible to fly at such a height that with present types of machine an adequate landing ground shall always be within reach.

There is however another vital requisite to safety—namely that the pilot shall find his way to that ground at once. And the essential danger of flying at the present time may be said to lie in the fact that if a machine flies high enough to be always within reach of a safe landing ground, it will often have to fly out of sight of that ground, and in that event the pilot cannot find his way to it, and is likely to crash on unsuitable ground.

Under conditions of mist or low cloud the pilot has the alternative of flying at a height above the clouds, and seeing nothing of the earth—or of scraping the tree tops, where he can see the ground.

In the one case an engine stoppage gives him a large area over which he may choose a landing point but leaves him in ignorance of the nature of the surface at that point, in the second he is able to see the ground on which he will have to land, but he has no choice of landing elsewhere. On the face of it there is little to choose between the two alternatives. In fact as an engine does fairly often give a little notice of its impending stoppage the pilot who is in sight of the ground has possibly a slightly better chance of making some kind of landing. At least he knows his height from the ground to within a few feet—whereas he who glides through the clouds or fog has no such knowledge.

In either case a forced landing of this type is a distinctly dangerous matter.

#### FOG.

For conditions of fog or low cloud there are but two ways of rendering a forced landing safe. One is to provide over the whole route a strip of landing ground, so that a machine may land anywhere along the route. The pilot may fly

either high or low in that case, and the question of the exact height of the surface need not worry him, for in the absence of obstacles along the route, a mechanical landing device will look after this particular difficulty.

The alternative is to provide signalling and guiding devices which do not depend on vision, which tell the pilot at any instant the exact bearing and distance of the nearest landing ground. The pilot must then fly at a height such that he is never out of reach of such a ground. The number of landing grounds necessary on a given route will depend as it does in clear weather, on the gliding angle of the machine and on the height at which it is practicable to fly. For commercial purposes this height will not be very great—almost certainly not more than 6,000 ft., which with existing machines will mean one ground with guiding gear every 12 miles or so.

#### GUIDING GEARS.

The size of the necessary grounds will not only be dictated by the landing speed and pulling up qualities of the machines alone as in clear weather, but also by the accuracy of whatever guiding gear is in use.

Directional wireless, or the cable guiding system developed in France by M. Loth are both able to provide the type of guidance necessary.

Neither of them at present has been proved capable of highly accurate work, and the landing grounds would have to give a large space tolerance for inaccuracy in locating them. There is no doubt whatever that methods can and will be developed which will bring an aeroplane reasonably accurately to a given point which is invisible to the pilot himself. At present the "point" so attainable is far from satisfying the Euclidian definition.

For instance with present wireless directional methods some appreciable time is occupied in taking bearings, interpreting them and signalling the result to the pilot. Consequently when the pilot receives the result, he is some miles from the spot at which he was when the bearings were taken. This is immaterial for general navigation but rather serious if it is a question of finding a ten-acre field. Better methods are available for this specific purpose, the case is mentioned as an example of the general nature of the troubles to be overcome.

#### APPLICATION TO PRACTICE.

If now one applies these considerations to a specific route—say London-Paris—it is obvious that the use of the strip of landing ground would be prohibitively costly. The provision of landing grounds every 12 miles—each equipped with an as yet non-existent guiding gear—would be a large undertaking—even if the guiding gear were so accurate that the grounds might be of the bare size necessary for landing.

The cost of such an organisation may come into possible limits when aeroplanes can safely land in very small spaces, and guiding gears are developed which will work in a fog as accurately as man's normal vision in clear daylight.

So far the conclusions reached do not seem particularly helpful. So far as London-Paris are concerned they are not. This route is not and for some considerable time will not be safe during anything but clear weather. If it is essential that operations be maintained on it, then the operators must either face interruption by fog—or take the very heavy risks of flying through the fog.

But there are many other routes in existence. There are places where fog or low cloud are as rare as they are common between London and Paris. There are routes over districts in which land is less valuable than that of Surrey, Kent and the North of France. Frequent large landing grounds then might be possible. It is not unthinkable that over some such routes it might be possible to use machines of lower cruising, and consequently lower landing speed, calling for smaller ground space. And finally there are even places where the continuous strip of landing ground is a possibility.

And if there are not yet there remains the sea. The sea gives an unobstructed alighting surface—or a very near approach to it. Wireless is accurate enough now to tell a seaplane its position nearly enough to allow it to escape ramming the coasts of England—or any other moderate sized island.

It is all very well to run the London-Paris service as a piece of full-scale research. But that service can do precious little towards supporting the British Aircraft Industry—and if the general development of Civil Aviation is to wait till the problem of safety on that route is solved satisfactorily that industry will undoubtedly starve in the interval.

Why not concurrently look for routes over which safety—within reasonable limits—can be secured at once and operate them so that the Aircraft Industry can earn its bread and butter—plus a little extra to be divided between jam and the improvement of the aeroplane and its adjuncts?

The new approved seaplane route is a step in the right direction. It ought to have been taken two years ago, and there is not the slightest reason why there should not by now be a whole network of seaplane services operating over the Channel and the North and Irish seas.—W. H. S.



# NAPIER

450 h.p. Aero Engine.

**L**ast month for the first time in one week the double return journey between London and Paris was made each day for 5 days by one machine—a single 450 h.p. Napier D.H.34. A total distance of **4,600** miles was covered.

This further demonstrates Napier's wonderful Reliability, efficiency and economy.

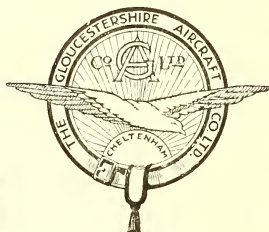
The Highest Prize in each of the three classes of the Air Ministry competitions was awarded Napier engined machines

**D. NAPIER & SON, LTD.**  
*14, New Burlington Street, W.1.*  
Works: ACTON, LONDON.  
W.3.

**The Proved Best.**

# Present Holders of the British S T

"And the workmanship throughout shows that the Gloucestershire Aircraft Co. Ltd. is worthy to rank among our best Aircraft Constructors, which is to say among the world's best."—*The Aeroplane*, July 20th, 1921.



# GLOUCES AIRCRA

## Winners of the Aerial Derby 19 ANOTHER FINE

"The Evening News" of Dec. 19th, 1921, says:—

**"'Bamel' beats the World."**

**"212 Miles an Hour of British Machine and Pilot."**

"To-day the 'Bamel' aeroplane has proved itself the fastest thing in the world. By flying at 212 miles an hour at Martlesham, Suffolk, to-day . . . . . the first time a British 'plane has achieved this success.

"Mr. 'Jimmy' James was the pilot of the machine which made flying history to-day.

"The Bamel, whose official name is Gloucestershire Mars I, was designed and built by the Gloucestershire Aircraft Co., Ltd., Cheltenham, Mr. H. P. Folland being their designer.

"She is fitted with a Napier 'Lion' engine of 450 horse power.

"The tests at Martlesham were made over a flying kilometre.

"This she covered at 212 miles per hour over an average of four of these kilometres twice in each direction.

"She attained an average speed of 196.6 miles per hour. The previous best for this was 194."



**GLOUCESTERSHIRE AIRCRAFT CO. LTD.**  
High Speed Racing Type

**SUNNINGEND  
WORKS  
CHELTENHAM  
ENGLAND**



**CONTRA  
THE BRITISH  
& FOREIGN  
ENQUIR**

ed Record, 196.6 miles per hour.

E  
**GLoucestershire**  
**AIRCRAFT**  
**CO. LTD.**



"Et la main d'œuvre d'un bout à l'autre montre que le Gloucestershire Aircraft Co. Ltd., mérite une place dans le premier rang des constructeurs d'avions, c'est à dire qu'ils sont parmi les meilleurs du monde."—*The Aeroplane*, July 20th, 1921.

—Fastest Time and Handicap.  
**PERFORMANCE.**



' COMPANY'S ' MARS I.'

(with 450 h.p. Napier Lion).

ORS TO  
 AIR MINISTRY  
 GOVERNMENTS  
 INVITED.

"The Daily Mirror" of Dec. 20th, 1921, says:—

**"Mr. J. H. James Flies at 212 Miles  
 an Hour."**

**"Timed by the Ministry."**

"The well-known British racing pilot, Mr. J. H. James, yesterday, at Martlesham Heath," attained "over a distance of one kilometre (seven-eighths of a mile) a speed of 212 miles an hour.

"Over four kilometres the average speed was 196.6 miles an hour. The machine was the Napier Mars racing biplane.

"The previous world's record was held by Sadi Lecoq, who, on September 26, flying a French racing aeroplane, covered a kilometre at a speed of 206 miles an hour, his average for four kilometres being 194 miles an hour.

"Formalities connected with the international regulations governing official air records will have to be observed before yesterday's phenomenal speed is officially declared a world's record, but as these trials at Martlesham Heath were superintended by the Air Ministry there is little doubt that Mr. James' speed of 212 miles per hour will be recognised as constituting a world's record."



**SUNNINGEND  
 WORKS  
 CHELTENHAM  
 ENGLAND**





**Present Holders of the British Speed Record, 196.6 miles per hour.**

**THE**

# GLOUCESTERSHIRE AIRCRAFT CO. LTD.

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**GLOUCESTERSHIRE AIRCRAFT COMPANY'S 'MARS I.'**

High Speed Racing Type (fitted with 450 h.p. Napier Lion).

CONTRACTORS TO  
**THE BRITISH AIR MINISTRY  
& FOREIGN GOVERNMENTS**  
ENQUIRIES INVITED.

SUNNINGEND  
WORKS  
CHELTENHAM  
ENGLAND



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### BELGRADE-LONDON IN THE DAY.

One of the most remarkable of flying achievements yet on record is the flight made by Mr. Alan J. Cobham, the De Havilland Co.'s pilot, on June 8th and 9th last.

Mr. Cobham and a D.H.9 had been chartered by the *Daily Mirror* to transport photographs and films of the wedding of the King of Serbia to Princess Marie of Roumania from Belgrade to London in the shortest possible time. The wedding took place on the morning of Thursday, June 8th. It was hoped that it would be possible for Mr. Cobham to reach Croydon soon after midnight, and thus allow the *Daily Mirror* to publish the photographs on the morning after the event.

Mr. Cobham left Belgrade at 11.30 hours and made for Vienna. His start was coincident with the beginning of a violent thunderstorm—rain and violent winds persisted the whole way to Vienna, which was reached at 15.05 hours. An hour was spent here in filling up, and at 16.00 hours a fresh start was made.

His route was via Munich to Strasbourg. Heavy rain and thunderstorms were encountered right across Germany, the visibility was extremely poor. For very much of the way landing grounds for emergency use simply do not exist. At 20 hours 10 mins. Mr. Cobham landed at Strasbourg—well up to schedule time—and again filled up and looked over his machine.

At 21 hours he started on the last stretch to Croydon in the dark, and safely kept on his course to the neighbourhood of Mézières, about 40 miles N.E. of Reims.

Shortly after Mézières, however, he ran into thick fog. He thereupon doubled back on his course in the hope of flying out of fog and finding his way round, but failed entirely to get clear. After nearly colliding with a factory chimney, he spotted an open patch of ground, and safely side-slipped onto it—to find that he had landed up hill and pulled up within a few yards of the edge of a quarry. This was at a few minutes after midnight.

A few local inhabitants soon collected around the machine, and Mr. Cobham discovered that he was in the vicinity of Douai, and that one of his tyres was punctured. Aided by the inhabitants, who held lights for him, he changed tyres, and was thereafter provided with a chair wherein to rest, waiting for dawn.

At 03.00 hours the fog was still thick. At 04.00 hours a start was made despite fog, and the aerodrome at St. Ingelvert was found at 05.45 hours, still in fog. The fog was still thick at 07.00 hours, but Mr. Cobham left, and flying at 50 to 100 feet, crossed the Channel and flew towards Croydon. The fog made it necessary to scrape chimney pots the whole way and rendered hopeless the idea of trying to get over the hills east of Croydon, so Mr. Cobham made a detour and attempted to fly round via Dorking. Conditions to the south were just as bad, and eventually he gave up the attempt and flew back to Farnhurst, where he landed at 08.00 hours.

At Farnhurst a motor-car was commandeered and driven to the *Daily Mirror* office, via Croydon, where plates, etc., were duly put through the Customs, and Mr. Cobham delivered the goods at about 10.00.

The *Daily Mirror* did not publish photographs of the wedding until two days after the event. That, however, was at least one clear day ahead of what would have been possible by the use of any other method of transport.

To have completed the journey at all under such foul conditions must be reckoned to have been a much greater performance than would have been flying through to schedule time under favourable weather conditions. Mr. Cobham has been the recipient of many congratulations upon this performance. He deserves them all.—W. H. S.

### THE STORY OF THE SPAD CRASH.

On Saturday last sundry morning and evening papers made known to the public certain theories and facts about the Spad which fell into the Channel, which have been common talk among the Air Line community ever since the day of the accident, June 3rd. The theory announced in these papers was that Doctor Gordon Ley went mad in the air, or perhaps one should say went madder in the air, and shot Monsieur Morin, the pilot.

This theory fits in with the actual behaviour of the machine. It is known that the machine on reaching Folkestone flew a circuit over the town and dived straight into the sea as soon as it left the coast. It is not the custom of Air Line pilots to perform unnecessarily circles on the way, but M. Morin may have made the circuit to get under some clouds. There seems no earthly reason why the machine should go direct into the sea. Admitting the theory that Dr. Ley shot Morin, it is possible that he had something in the nature of a struggle with the pilot, which might account for the circuit. Thereafter it seems he shot him, with the

result that the pilot fell forward onto his controls and pushed the machine into the sea.

Whatever truth there may be in the story, there is at any rate sufficient likelihood about it to make it evident that the Air Ministry's latest Order forbidding passengers to sit alongside pilots on Air Lines was produced by the theory, if not by the actual proven fact, of Morin's death.

The story as concocted by rumour in conjunction with known facts is at any rate the equal of any shilling shocker ever produced. If Gordon Ley had survived he might almost have pleaded when put on trial, as do juvenile criminals in these days, that he had been too much to the "movies."

On the afternoon of June 3rd, which was the last race meeting at Croydon, one happened to be talking to two of the regular pilots there when the news came in that Ley was one of the passengers on the lost machine. One of the pilots remarked, "Oh, that was the chap who went over to France a week or so ago to shoot a Frenchman. He is perfectly mad"—or words to that effect—and the other one remarked, "Yes, I know the fellow. *He's no loss,*" and they then proceeded to regret the loss of Morin, who was quite popular with the people at Croydon.

Then one of them related a queer story of how on May 20th this man Ley had chartered a machine all to himself and had flown over to Le Treport carrying a large revolver with the deliberate intention of shooting a Frenchman who had apparently gone to France with a young woman on whom Ley had fixed his affections. It was also remarked at the same time that undoubtedly Ley was what is commonly called a "dope fiend." So much, at any rate, is fact, or as near it as no matter.

Some days later came the information, which did not come out at the inquest, that when Morin's body was recovered most of his head was missing. This seems to be confirmed by Dr. Varley, of Cadogan Place, who was on the "Maid of Orleans," the cross-Channel boat which went to fish up the wreck. "The Star" quotes him as saying, "At the time, the injury appeared to me as unlikely to have been caused by the crash."

Now it is perfectly true that when falling from a height water is no softer than land, but one has seen the results of several crashes on land and although one has seen heads fairly badly battered one has never seen the top of a man's head knocked clean off. Some people have suggested that this had been caused by the pilot falling into the aircrew. This would be impossible, because the machine went in nose first and the crew would be the first thing smashed, long before the pilot had even hit the windscreen or instrument board. On the other hand, if one puts a loaded revolver up against the side of a man's head and pulls the trigger, there is not much of his head left afterwards, and the probability is that any marks of burning would, in such a case as this, be washed out by the sea before the body was recovered.

Also it is common talk among pilots that when Ley went to Le Treport he failed to find the man and woman for whom he was searching, though one believes that some of the French papers tell a weird story of his having found them and having been persuaded not to shoot them on that occasion. The story among the pilots is that he came back from Le Treport disappointed, saying that life was no longer worth living and that he was going to put an end to himself, but that anyhow he was going to do in some Frenchman or other before he went out himself. Assuming this statement to be true, assuming the known facts that he was fond of carrying a gun and that he was sitting alongside M. Morin and was not a passenger inside the machine, one has at any rate a string of evidence which makes a perfectly good working theory for the whole affair.

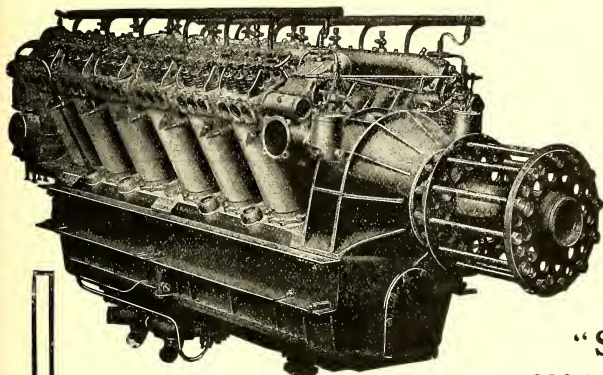
The Air Ministry's Order forbidding passengers' sitting alongside pilots is quite sound, though, of course, in the case of a lunatic like Ley it would not prevent him from sitting inside the cabin and shooting the pilot in the back or the stomach, according to whether the pilot was sitting in front or behind him. For the matter of that, even if passengers on aeroplanes were forbidden to carry guns there are still plenty of other ways in which a determined suicide could wreck the machine. But the new regulation does at any rate prevent the possibility of an unarmed but crazy passenger interfering with the pilot's work at a critical moment when landing or getting off.

On previous occasions one has remarked that possible theories explaining otherwise inexplicable accidents are at any rate useful in that they suggest safeguards against the occurrence of accidents for such reasons. From this point of view even though the murder and suicide theory in this case may be incorrect it has at any rate suggested a very valuable Order.—C. C. G.

### WANTED.

Will any reader of THE AEROPLANE who has a copy of January 23rd, 1918, oblige another reader of THE AEROPLANE by sending to The Editor, 175, Piccadilly, stating price.





## "SIKH"

1,000 h.p. 12 cylinder

The following list of Engines, designed and manufactured by the Company, is unequalled in its range. All these engines are of proved efficiency and extreme reliability, and can be recommended with confidence for aviation purposes of all kinds.

"DYAK" .. ..	100 h.p. 6-cylinder	"SIKH" .. ..	1000 h.p. 12-cylinder
"ARAB 2" (Direct Drive)	200 h.p. 8-cylinder	"MAORI" .. ..	275 h.p. 12-cylinder
"MANITOU" .. ..	300 h.p. 12-cylinder	"COSSACK" .. ..	350 h.p. 12-cylinder
"MATALELE" .. ..	400 h.p. 12-cylinder	"SIKH" .. ..	500 h.p. 6-cylinder

*We shall be pleased to supply specifications, installation diagrams, prices, and any other information upon request.*

# SUNBEAM-COATALEN AIRCRAFT ENGINES

THE SUNBEAM MOTOR CAR CO., LTD.

WOLVERHAMPTON	Head Office & Works	Moortield Works
LONDON	Showrooms & Export Dept., 12, Prince's St., Hanover Sq., W.1.	
MANCHESTER	Southern Service & Repair Works, 177, The Vale, Acton, W.3.	
"	Showrooms	106, Deansgate
"	Northern Service & Repair Works, 288/294, Eccles New Rd., Weaste	
NEW YORK	Showrooms	25, West 57th Street

## THE ROYAL AERONAUTICAL SOCIETY.

## OFFICIAL NOTICES.

**EXAMINATION.**—The first Associate Fellowship examination of the Royal Aeronautical Society in accordance with the new regulations will be held on Monday, September 25th (Part I) and Tuesday, September 26th (Part II) in the Library at 7, Albemarle Street, London, W.1. Entries, accompanied by the prescribed examination fee, should reach the Secretary at that address not later than Monday, August 28th.

**R.38 MEMORIAL RESEARCH FUND.**—It has been decided to utilise the Royal Aeronautical Society's R.38 Memorial Research Fund as follows:—

- (a) To the placing of a memorial tablet in the Society's offices.
- (b) To the awarding of an annual prize of 25 guineas for the best technical paper on aeronautics, preference being given to those dealing with an airship subject. This prize to be open to international competition.
- (c) To the selection and collation of information on the development of design of airships to the present stage.

The balance of the income being allowed to accumulate for the present.

**USBORNE MEMORIAL FUND.**—The interest of the Usborne Memorial Fund is to be devoted to the award of a prize in every alternate year (unless the amount be such as to allow of an annual prize to the value of £10) for a historical paper on any aspect of aeronautics. This prize will also be open to international competition.

Detailed regulations for these two prizes are being drawn up.

21st June, 1922.

W. LOCKWOOD MARSH, Secretary.

## SMALLWARE SUPPLIES.

In these days presumably the few remaining aeroplane manufacturers in this country all have their regular source of supply of what is to them raw material. At the same time there must be many firms in the British Colonies and in foreign countries who, having acquired aeroplanes in England, are rather doubtful as to where to get the material necessary for repairing or reconditioning these aeroplanes.

It is particularly what one may call the smallware of aircraft material which are not easily located. For example, everybody knows how and where to buy steel tubes and steel and to a certain extent timber, though it is much more difficult to locate a really reliable timber firm than it is a really reliable steel firm. Therefore, people who are either building new machines or are reconditioning old ones will do well to make a special note of the name and address of John MacLennan & Company, 115, Newgate Street, E.C.1, who can probably claim to have supplied more of what one might call the trimmings of aeroplanes than any other firm.

This firm specialises in cotton and linen tapes, and in webs and bindings which are so largely used in wing construction, as, for example, in the doped binding of spars and ribs. Flax string of the kind known as kite cord, which is used in aeroplane work for sewing fabric on to the ribs, is supplied in large quantities and of a somewhat similar nature is the lacing cord used for lacing up fabric coverings of fuselages. In the same class come their special linen threads for stitching wing fabric together.

In another direction the firm does a big business in jute packing web, which is used chiefly for packing spares for export. This, of course, is equally useful when transporting spares, say, from a Colonial capital to an up-country customer.

It is particularly interesting to note that the qualities in all these goods which the MacLennan firm keep in stock have been approved by the Air Ministry and conform to the latest specifications. For example, the flax kite cord conforms to the B.E.S. specification F.35, the Fuselage Lacing Cord to B.E.S. specification F.32 and the linen threads to B.E.S. specification F.34.

Quite apart from the actual structure of the aeroplane itself people concerned with aviation will probably be glad to know that MacLennan & Company also supply insulating tapes, such as are used for armature winding, tubular sleeving for insulating electric wires and armature binding cords. In these days when everyone is by way of being an electrician and likes to repair his own electric apparatus it is useful to know where such things as these can be bought.

There is another advantage to aircraft firms in dealing with MacLennan & Company, namely that whereas so many firms who used to supply raw material in large quantities for aircraft work have now entirely dropped the trade, and are therefore out of touch with the demands of the Aircraft Industry for material suitable for the latest designs of aircraft, MacLennan & Company have never lost touch with their aircraft customers, and, therefore, it is possible to depend upon them to supply whatever is the latest idea in their particular line.

## BEGGING THE QUESTION.

The Press campaign in matters aeronautical continues in full swing. Very obviously the lay journalists have realised that the claims of the Royal Air Force to be recognised as our first line of defence having been proved beyond all doubt, the Government must and will very shortly take steps to establish that Force upon a scale commensurate with its real importance. They have therefore set about preparing their claim to have forced the Government's hand in this matter, when as a matter of fact if there has been any forcing at all it has been carried out by the members of the very Air Ministry which is now being attacked for its supine attitude.

Unfortunately for the Press they have in the main accepted the views of certain disgruntled R.A.F. ex-officers, men undoubtedly of some considerable ability—who rose to high, or highish, rank during the war—but whose capacity to lay down the general lines of a sound aerial policy is to say the least questionable.

The *Times* claims that the policy of a subsidised civilian reserve to the Air Force advocated by Brig.-Gen. P. R. C. Groves has been stated with "unanswerable force and logic." Of course this claim is correct in more ways than one. General Groves is admittedly unanswerable—so far as *The Times* is concerned—so long as the answers are carefully withheld from publication. Also there is little wrong with General Groves' logic—the real trouble is that the whole of his premisses are false. And therefore the sounder his logic the more certainly erroneous must his conclusions be.

## THE ROLLS-ROYCE ENGINE WORKS.

According to a statement made in *The Times* by a representative of the firm, Rolls-Royce Ltd. are seriously considering closing down their Aero-engine works at Derby, owing to the lack of orders. A certain number of orders for foreign Governments are now in hand, but no engines are now being made for the British Government.

Very obviously the demands of British Civil Aviation could not keep the works busy—and experimental work, which is still being carried on, has not received any very solid support from the Government. Under all the circumstances a temporary shut down of this branch of their business would be a very natural—if regrettable—procedure on the part of the firm.

Fortunately one feels fairly certain that the shutting down—if it occurs—will be only a temporary affair, and that when the inevitable renewal of a demand for high-powered engines comes along Rolls-Royce Ltd. will be in a position very rapidly to cope with it.

## A SUCCESSFUL DEBUT.

An Australian Pilot, writing under the date of April 18th, says, "We have to-day been testing the first of the Fairey 3Ds, supplied some months ago at Point Cook, Victoria. The machine gave every satisfaction and pleasure to those concerned."

This of course is only what one would expect from any machine built by the Fairey Company, but all the same it is well to have it confirmed by an unbiased observer who is intimately concerned with the wisdom of the choice of the Australian Government.

## AIR MINISTRY NOTICE TO GROUND ENGINEERS.

NO. 7. 1922.—REPAIR OR OVERHAUL OF LICENSED AIRCRAFT: APPROVAL OF MATERIALS.

It is hereby notified:—

1. Ground Engineers licensed in categories "B" and "D" are reminded that, before they can certify as airworthy aircraft and/or aeroplanes that have been repaired or overhauled, they must have evidence that all materials used in such repair or overhaul have been proved by test, at an approved test house, to comply with all the requirements of the appropriate specification.

2. Similar proof that the material is correct is essential for spares or fittings purchased and built into aircraft or aero engines and, should the spares be of such a nature that a complete inspection is impossible on the finished part, the Ground Engineer should ascertain that the manufacturing process or internal workmanship, which cannot be seen in the finished article, has been satisfactorily carried out.

3. Many manufacturers of aircraft materials and spare parts are able to issue certificates with regard to material, process inspection and/or workmanship.

4. Where such certificates cannot be obtained, the Ground Engineer must make other suitable arrangements to prove the condition of the material.

5. Ground Engineers licensed only in categories "A" and "C" are reminded that they are not empowered to certify repairs or overhauls.

Air Ministry, 12th May, 1922.

## MORTGAGES, CHARGES &amp; SATISFACTIONS.

TRIPLEX SAFETY GLASS CO., LTD.—(a) Particulars of £75,000 debentures and a bonus of 5 per cent. authorised April 20th, 1922, filed, charged on the company's property, present and future, including uncalled capital; present issue £50,000; and (b) also charge on the company's leasehold property, and machinery, dated April 25th, 1922, as collateral security for £30,000 debentures, registered. Holders:—Cox and Co.

# THE DE HAVILLAND AEROPLANE HIRE SERVICE

(THE DE HAVILLAND AIRCRAFT CO., LTD.)

Telephone—  
KINGSBURY 160 161

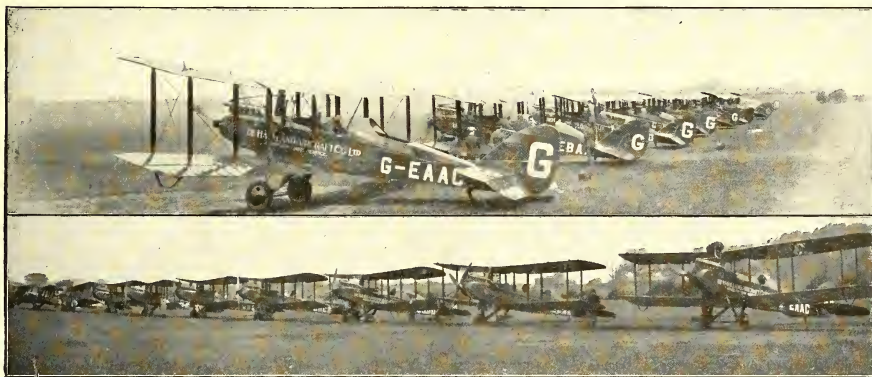
## STAG LANE AERODROME

Telegrams—  
"HAVILLAND,  
EDGWARE,"

(ON THE MAIN EDGWARE ROAD 7 MILES FROM THE MARBLE ARCH),

## EDGWARE, MIDDLESEX.

QUOTATIONS GIVEN AND MACHINES BOOKED BY LETTER, TELEGRAM, OR TELEPHONE.



REAL COMMERCIAL AVIATION.—The fleet of De Havilland 9 ("Puma" engine) taxis which were used to distribute Derby films all over Great Britain, standing on their rank at Stag Lane, waiting to start on May 31st.—  
From "The Aeroplane," June 14th, 1922.

### A MILESTONE IN THE HISTORY OF TRANSPORT.

On May 31st the Derby was run at 3.30 p.m. Cinema photographs taken on the course at Epsom were collected, delivered to a DeH. 9 aeroplane in a field near by, and carried by air to Barnet, where they were developed and printed.

DeH. 6 aeroplanes were then used to ferry the films as they left the printers' hands, to Stag Lane Aerodrome. The first batch of films was received at 5.47 and the last at 6.20.

The following shows the towns to which films were delivered, and the times at which they were shown on the screen.

Aberdeen ... 10.35 p.m.	Glasgow ... 10.35 p.m.	Peterboro' ... 9.12 p.m.
Liverpool ... 9.10 "	Sunderland ... 8.50 "	Plymouth ... 8.45 "
Hull ... 8.45 "	Leigh ... 8.55 "	Newcastle ... 8.20 "
Leeds ... 8.12 "	Ashton-under-Lyne 8.20 "	Wolverhampton 8.10 "
Walsall ... 7.45 "	Birmingham ... 7.40 "	Bristol ... 7.30 "
Nottingham 7.13 "	Brighton ... 7.10 "	Leicester ... 7.4 "
Portsmouth... 7.45 "	Worcester*	Sutton*
Manchester*	Edinburgh*	Darlington*
Exeter*	York*	

\* Exact times not known.

6 Aeroplanes were used for this work.

The above is only ONE of many recent triumphs, but it demonstrates the practical commercial possibilities of the Aeroplane.

## THE DE HAVILLAND AIRCRAFT CO., LTD.

MANUFACTURERS AND DESIGNERS OF  
AIRCRAFT USED ALL OVER THE WORLD.



# SKY WRITING

*The whole of the means of effecting sky writing is protected by a series of patents, granted and pending both at Home and Abroad*

A sky writing demonstration of your trade mark or business slogan rivets the attention of everyone within an area of over 100 square miles and the cost *per square mile* is in most cases less than newspaper "space" *per square inch*.

Every contract helps nationally in increasing our civil aircraft reserve and in keeping first-class fighting pilots and ground engineers in training.

Enquiries to sole patentee :

MAJOR J. C. SAVAGE,

7-8 Norfolk Street,

Strand,

London, W.C. 2.

Telephones

Central 8971, 8972.



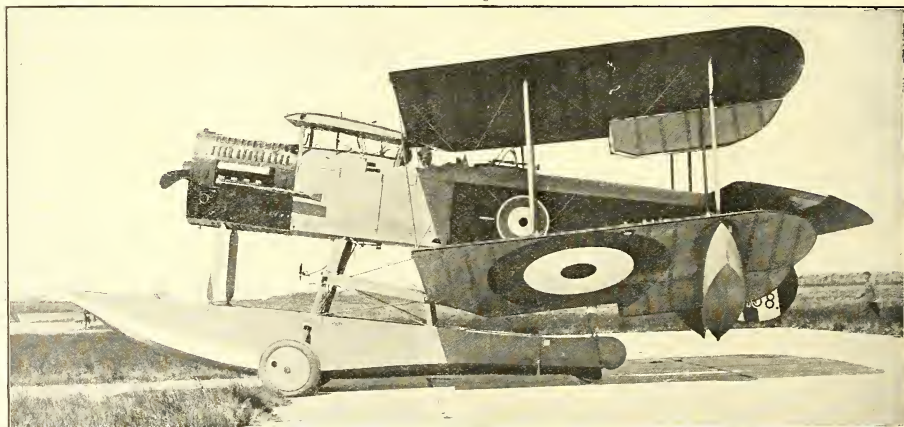
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## R.A.F. INTELLIGENCE.

## Sir Henry Wilson's Funeral.

Air Chief-Marshal Sir H. M. Trenchard, Bart., K.C.B., D.S.O., A.D.C., acted as a pall bearer at the funeral of the late Field-Marshal Sir Henry Wilson on June 26th.

Among those present were Col. R. Waterhouse, C.B., representing Group/Capt. H.R.H. the Duke of York, K.G., G.C.V.O., Sir W. E. Nicholson, Mr. Noel Smith representing Sir Sefton Branker, Air Vice-Marshal and Mrs. Vyvyan and Sir Frederick and Lady Sykes.

## The New South African War.

Those who take the trouble to read the small news paragraphs in the daily Press may have noted casually that the South African Air Force has recently been in action against troublesome Hottentots in what used to be "German South-West." One gathers from a friend in South Africa that four or five aeroplanes are now operating in that area.

There is a certain grim humour about this affair which may have escaped the notice of the younger generation of aviators, who probably did not read the newspapers before the War, most of them being then at school. For a good many years prior to the War the Germans who then owned that particular area of South-West Africa were engaged in a prolonged guerilla warfare against the Herrero tribe of these same Hottentots.

Horrible tales were then told of German atrocities when they rounded up whole tribes and shot them down with machine-guns, very much in fact as the ancestors of some of us shot down whole tribes of black fellows in Australia after having invited them to a peaceful feast—except of course that in those days there were no machine-guns in Australia. It was at any rate more humane than driving them out into the desert to die of hunger and thirst. The fact seems to have been in both cases that the niggers were absolutely unmanageable and either had to be exterminated or else allowed to plunder and murder the white settlers at will.

One forgets how many troops Germany sent to South-West Africa at that time, but it ran into some tens of thousands, and naturally the heavily-equipped German infantry made but little progress over deserts and through thick bush against the Hottentots. Eventually, a year or two before the War, the Germans called in the help of a number of Boers and British South Africans who, being used to bush fighting and desert trekking thanks to our South African war, were able to make something of a job of the Hottentots, who thereafter remained fairly quiet. One of the jokes of the invasion of German South-West Africa in the late War was that quite a number of General Botha's Army went into action against the Germans wearing the German Herrero medal for their work against the Hottentots.

Now it appears that the South African Government of what used to be German South-West is having precisely the same trouble with the Hottentots that our late enemies had, and doubtless in due course we shall have screams in this country from those curious people who are the friends of every country but their own, the kind of people for example who are collecting vast sums of money to feed the rising generation of Russians so that they may in due time kill a certain number of the rising generation of Englishmen. These people will of course charge the South African Forces with committing atrocities on the Hottentots much as we all charged the Germans with atrocities on the same troublesome people.

The South African Forces, however, have the advantage of possessing aircraft of a sort, albeit most of them time-expired and probably dangerous to fly. Still, they will probably serve their purpose and may be able to keep the Hottentots quiet, just as a few aeroplanes are able to keep peace in Somaliland and Iraq and Trans-Jordan, and even on the Indian North-West Frontier, where whole armies have failed to do so in the past. One wishes the South African Air Force every success in its latest little war.—C. G. G.

## The Northolt Accident.

On Thursday Flight Lieut. R. St. C. McClintock, M.C., of Manston, was killed at Northolt while flying a "Snipe" in practice for the Inter-Unit Relay Race. A number of curious stories have been circulated among the R.A.F. concerning the cause of the accident. It has been alleged, for example, that the whole of the leading edges of all his planes caved in under the air pressure, with the result that the machine dived into the ground. Such a story is absurd on the face of it, for it is practically impossible for the leading edges of all four planes to go at the same time, and if the leading edge of only one plane had gone the machine would certainly have spun towards that side, though, as a matter of fact, the probability is that so skilled a pilot as Mr. McClintock would have held the machine straight after one bad swerve and would have made a safe landing. Another story is that the tail came off the machine. As a matter of fact, both these stories are entirely unauthentic.

An official enquiry is being held into the affair and possibly the findings may be published later. In the meantime the evidence of witnesses points to the fact that Flight Lieut. McClintock, who was flying without being strapped into his seat, was thrown out of his seat by a bad bump and fell forward onto his control lever. He was at a height of only a few hundred feet and before he could recover the machine had hit the ground.

The opinion of several experienced eye-witnesses is that he must have been thrown right up into the centre section of the machine, for his body was found a matter of forty yards or so ahead of the machine, and his seat cushion was between him and the wreck. The machine itself exploded rather than caught fire on hitting the ground. There was just one enormous blaze of flame for a few seconds and then the fire died out.

All the stories about the machine collapsing in the air and catching fire in the air are as untrue as the stories about the collapsing of the leading edge and the falling off of the tail. Also it is impossible that he could have been saved by any type of parachute, for the time which it took to dive was too short for a man's mind to work, let alone to allow him to operate any form of mechanism even if the mechanism itself worked instantaneously when set in motion. If he could not reach his control lever to right the machine he could not have reached any other operating gear. It was just a plain unavoidable accident and should be a lesson to pilots to use the safety belts which are provided for them.—C. G. G.

## The Aldershot Tattoo.

Bristol Fighters, belonging to the R.A.F., Andover, and flown by F/Lts. T. E. B. Howe, A.F.C., J. A. G. Haslam, M.C., D.F.C., and F/O A. J. Warwick, gave a demonstration of flying by night with their machines illuminated. The organising committee included S/Ldr. C. H. B. Blount, M.C., R.A.F.

## The School of Military Administration.

The following officers of the R.A.F. passed the Senior Officers' Course, No. 2, at the School of Military Administration, Chisleton, between January 13th and April 7th:—Wing/Cmdrs. A. V. Bettington, C.M.G., H. S. Turner, M.B.E., and H. R. Nichol, O.B.E.

## A Readjustment of Expenditure.

In a letter to the *Times* recently, Mr. T. G. Tulloch says:—

"I venture to express the opinion that command of the sea, in the future, will be dependent, first of all, on command of the air, and until the latter is assured the former cannot be attained, as the very weapons which, hitherto, have implied sea power will themselves be at the mercy of air power.

"Let us therefore begin to talk of 'air power,' and readjust our expenditure, on weapons of war for defence, on a basis of relative values. We cannot afford more than a certain amount for defence; therefore, let us apportion the money in such a way as to get the greatest value for it.

"This is not a question of a 'cheap substitute,' but of the best new combination. If it is cheaper so much the better; and the combination we advocate is so."

[If all the newspaper advocates of aviation would argue consistently along the eminently sensible lines advocated by Mr. Tulloch instead of talking nonsense about abolishing battleships and reducing the Army we should soon be very much nearer the ideal proportions of the three Fighting Services than we are at present.—C. G. G.]

## An Unintended Compliment.

One of the most delicious stories of the R.A.F. on foreign service comes from Palestine. Recently during one of the religious festivals which from time to time result in glorified faction fights in that area, a number of R.A.F. machines were sent out on reconnaissance over a certain district where trouble seemed possible, these machines being in wireless communication with the R.A.F. and Army authorities so that in case of disturbance sufficient forces might be rushed to the spot to deal adequately with the matter.

Happily no disturbance was reported, but two days after the feast one of the sheiks visited the squadron as deputy for the sheiks in his area to tender to the R.A.F. their thanks for the honour done them by providing an aerial escort to their processions from their villages to the holy place. His misunderstanding arose from the fact that he had been told on a previous occasion that important British personages moving from place to place were usually escorted by aircraft as a mark of respect.

Perhaps on similar lines the R.A.F. may be called upon to provide guards of honour for movements of the Irish Republican Army.

### THE BOYS' WING MAGAZINE (CRANWELL).

To quote from the Editorial in the first number of this magazine it is "of the boys, by the boys, for the boys," and if it goes on as well as it has begun it ought to be a huge success. The Editor and the boys are to be congratulated on the production of a paper which is interesting, informative and chock full of *esprit de corps*. Every kind of sport is adequately dealt with, showing that the Boys' Wing has had no small success in this direction. There are School Notes, Photography Notes, Literary and Debating Society Notes, and an account of the doings of the Engineering Society. The whole magazine speaks of the very high standard of keenness and intelligence which exists among the R.A.F. boys.

### THE DESERT MAIL.

(Cairo-Baghdad, 1922.)

Clean cut against the first faint flush of dawn,  
Their silver planes outstretched to catch the sun,  
Hastening to meet the Day as yet unborn,  
Faint upon the earth their engines' muted hum,  
Below—the Desert lies in shadow dim,  
A vast, inverted bowl of yellow sand,  
The distant hills, eternal guardians grim,  
Flanking the entrance to a barren land.

For His Majesty's Mails are travelling East,  
(Mark the Track as it winds below.)  
His Majesty's Mails are travelling East,  
(Six hundred weary miles to go!)

The ashes of a fire—lit all in vain—  
A Thing that breathed and lived yesterday,  
The charred and blackened wreckage of a plane,  
Are all that mark the Man Who Lost his Way.

An error of a minute, a side-slip in a cloud;  
He failed to see the Track he thought he knew,  
Then endless days of waiting—by fear and hunger cowed—  
Ere the jackals took the meat that was their due!

For His Majesty's Mails are travelling East  
(The Track is dim in the sand below.)  
His Majesty's Mails are travelling East,  
(Only two hundred miles to go!)

In the bitter cold of Winter, when the sullen engines fret,  
And the leader sky above him bids them stay,  
In the storm or in the sunshine in the dry or in the wet,  
The Air Mail passes swiftly on its way.  
In the hottest days of Summer, when the water-holes are dry,  
And the Desert's full of things that are not there,  
The gaunt and weary jackal sees the shadows passing by  
Of the Mail 'planes as they hurry through the air.

For His Majesty's Mails are travelling East,  
(The Arrow is pointing the way to go.)  
His Majesty's Mails are travelling East,  
(Those are the Bitumen Pools below.)

We have placed at your disposal all the arts we learnt in War,  
And for ninnepence you can purchase, if you're wise,  
The same efficient service of the Man who Yesterday,  
Chased the black-crossed Birds of War from out your skies.  
The letters that they carry from Cairo to the East,  
Bear little slips of paper, coloured blue,  
And the loss of crew and pilot doesn't matter in the least,  
If the Mail Bags see the Desert journey through!

For His Majesty's Mails are travelling East,  
(The Track is lost but the way we know.)  
His Majesty's Mails are travelling East,  
(Baghdad City to port below!)

J. O. P. E.

## AIRCRAFT IN PARLIAMENT

**CIVIL AVIATION.**—Replying to a question by SIR HARRY BRITTAIN on June 22nd, THE SECRETARY OF STATE FOR AIR said that there were 7 foreign owned passenger-carrying aeroplanes trading between their own country and England which only carry a single pilot. Ten of these will be replaced by machines fitted with dual controls. As these machines are to be controlled by wireless and it is expected that they will all be fitted with wireless in the course of the next three months.

**TRANS-EUROPEAN AIR ROUTES.**—On June 22nd, replying to MR. L'ESTRANGE MALONE CAPTAIN GUEST said that it is proposed to establish a new subsidised air route with flying boats from Southampton to Cherbourg and probably later to the Channel Islands, controlled at present though these routes may be extended within the limits of the money available. CAPTAIN GUEST also said that no negotiations for any British air line to the present been received on the trans-European routes has up to the present been received.

**CAPTAIN GUEST**, in reply to a question by Mr. Malone on June 22nd, said that some doubts exist regarding terminal aerodromes, landing grounds at route, wireless communication, for reporting, etc., on the London-Paris route had been received, but only two of them had been sufficiently concrete or definite to enable action to be taken. The two exceptions related to the surface of Crotoy aerodrome and delays in wireless communications. Representations have been made to the French Government to improve the wireless facilities

on their side of the route, the delay being due to the time necessary to reconstruct W/T stations. Experiments are in hand for finding a practical method of determining the vertical extent of fog and the suggested establishment of new stations for this purpose additional to the existing ones, but not considered of sufficient importance to ask the companies for the views of their pilots.

**THE THAMES AIR STATION.**—On June 22nd, in reply to a question by MR. CHURCHILL CAPTAIN GUEST said that negotiations have been pursued with a view to carrying out experiments on the rights to and from the Thames at Westminster but they have not borne fruit.

**INDIA-AUSTRALIA AIRSHIP SERVICE.**—THE PRIME MINISTER replying to LORD BELL on June 22nd, said that the results of the proposed airship service to India and Australia will be considered at an early meeting of the Committee of Imperial Defence.

**THE SHORT SERVICE COMMISSION.**—On June 22nd, replying to SIR H. BRITTAIN, CAPTAIN GUEST said that the Short Service Commission scheme of 1919 will provide a regular flow of qualified pilots into the Reserve. A number of these officers will pass into the Reserve in a few months time. Skilled men who have served in the ranks are also passing into the Reserve and will be available in case of national emergency. It is the policy of the Air Ministry to support aircraft constructors to the utmost extent compatible with national economy.

[Mr. H. T. Vane, of D. Napier and Son, Ltd., writes:—  
"Sir Harry Brittain informs me that he is not correctly reported in Hansard 155, No. 82, col. 1,488 in his supplementary question, and he has asked me to bring this under the notice of the technical papers. His supplementary question was really as follows:—  
"Realising that the Right Hon. gentleman appreciates as much as anybody else the necessity of the most efficient and reliable service, and that, in the event of a shortage of aircraft, the Ministry is prepared to do in the case of British plants having to close down while this lengthy consideration is going on?"

Replying to a supplementary question by SIR W. JOYNSON HICKS, CAPTAIN GUEST said that the annual flow of pilots would rise to about 200 and of mechanics, probably 2,000.

**CAPTAIN GUEST** asked THE PRIME MINISTER whether the Committee appointed to enquire into the position of the Naval Wing of the R.A.F. has held any meetings yet, when it is likely to conclude its labours and whether a report will be issued. THE PRIME MINISTER replied that no such committee was appointed. He added that a Committee was promised by the Leader of the House to examine into the system of naval and air co-operation but no formal meeting of that Committee has yet been held. He added further that he was not aware of any lack of machines or pilots for work with the Fleet and air training in co-operation with the Navy is being carried out efficiently carried on with the limited forces at our disposal.

THE SECRETARY OF STATE FOR AIR.—On June 22nd, MR. MALONE asked the Prime Minister whether in view of the present and increasing importance of the Air Force, His Majesty's Government will consider raising the status of the Secretary of State for Air to the same as that held by the First Lord of the Admiralty and the Secretary of State for War? THE PRIME MINISTER said that he was not prepared to propose an increase in the salary attached to any post in the Government at the present time, nor did he think it expedient to add to the numbers of the Cabinet. LORD BELL asked CAPTAIN GUEST whether he was taking the first Lord of the Admiralty and the Secretary of State for War out of the Cabinet.

## PERSONAL NOTICES.

### DEATHS.

MCCLINTOCK.—At Northolt, on June 22nd, as the result of a flying accident, F/Lt. Ronald St. Clair McClintock, M.C., R.A.F. VAN SOMEREN.—In the Malajal District on the borders of Uganda and Kenya, as the result of a hunting accident, W. N. Van Someren, late R.F.C.

### ENGAGEMENTS.

FELLOWS.—OSWALD.—The engagement is announced between Maj. Cuthbert Fellows, M.C., A.F.C., late R.F.C., second son of Rear-Admiral Sir Thomas Butler Fellows, K.C.B., of Stevenage, and Margaret Oswald, Whitegates, Stevenage, widow of Lieut.-Cmdr. Donald Oswald, R.N.

GREEN.—ROZELAR.—The marriage arranged between Major Frederick Michael Green, O.B.E., M.C.E. and Stella, widow of Leon Rozelar, will take place at noon, on July 5th, at the Liberal Jewish Synagogue, Hill Street, N.W.1.

Major Green was formerly at the Royal Aircraft Factory and is now the chief technical official of Armstrong-Whitworth Aircraft, Ltd.

MOODY.—HORN.—The marriage arranged between Henry Michael Moody, M.C., R.A.F., son of the Rev. Henry Moody, vicar of Welshampton, and of Ellensmere, and Mrs. Moody, and Austin Robina, youngest daughter of Mr. and Mrs. C. A. Horn, of Adelaide, South Australia, and Beaumont, Jersey, will take place at St. Aubin's, Jersey, early in August.

WILSON.—DENHAM.—The engagement is announced between Grenville Wainwright Wilson, A.F.C., R.A.F., only son of Captain A. C. Wilson, of Wilsdon, South Africa, and Cicely, youngest daughter of the late Joan Lane Denham, late of the Conynsteyt, Crofton.

### MARRIAGES.

DUNDAS-GRANT.—GALLOWAY.—The marriage arranged between Major James Dundas-Grant (late R.A.F.), younger son of Sir James and Lady Dundas-Grant, and Miss Katherine Galloway, younger daughter of Sir James and Lady Galloway, will take place on June 29th.

GOODBEHERE.—WARTHUR.—On June 16th, at St. Philip's, Alderley, by the Rev. G. H. Cooper, Percy Goodbehere, late Manchester Regt., and R.A.F. (Cinquepunter), youngest son of Mr. and Mrs. Goodbehere, of Manchester, and Mrs. Goodbehere, of Redmoor, Furness Vale, to Muriel Eugenie, eldest daughter of Mr. and Mrs. Warhurst, of Derby House, Wimslow.

TURNER.—RAY.—GALLEHEART.—On June 14th, at Eastbourne, F/Lt. Cresswell Turner, A.F.C., R.A.F., only son of Mr. and Mrs. J. Turner of Edgborough, Birmingham, to Norah Ethel, elder daughter of Mr. and Mrs. H. Ray-Engelhart, of Blackwater Road, Eastbourne.

### BIRTHS.

BALDWIN.—On June 25th, at "Springfield," Acton, the wife of S/Ldr. (Stores) F. A. Baldwin, Jnr., R.A.F., of Baghdad, Iraq—a son. BILES.—On June 14th, at "Langhill," Manchester Road, Sheffield, to Mr. and Mrs. Biles, a son, F/Lt. G. Biles, R.A.F. (Stores).

GASKELL.—On June 14th, at "Wimbold Park Road, Southfields, to the wife of S/Ldr. A. B. Gaskell, R.A.F.—a daughter.

HUNT.—On June 1st, at Katherine River, Port Darwin, the wife of Lieut. J. A. Hunt, late R.A.F. (Stores)—a son.

SEMPILL.—On June 20th, at Tsuchiura, Japan, to Eileen, the wife of Colonel the Master of Sempill, A.F.C.—a daughter.



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## COMMERCIAL AERONAUTICS.

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## CONTINENTAL ARRIVALS AND DEPARTURES.

ABBREVIATIONS:—A.D.—Aircraft Disposal Co. B.A. Berkshire Aviation Co. B.C.—Bristol Aeroplane Co. C.A.—Department of Civil Aviation. D.A.—Daimler Airway. D.H.—De Havilland Aircraft Co. G.E.—Compagnie des Grands Express Aériens. H.P.—Handley Page Transport Ltd. I.L.—Instone Air Line. K.L.—Koninklijke Luchtvaart Maatschappij. L.A.—Leatherhead Aviation Services. M.A.—Messageries Aériennes. M.W.—Marconi Wireless Telegraph Co. Ltd. P.O.—Privately owned. P.L.—Peters Ltd. S.F.—Surrey Flying Services.

## ANALYSIS OF FIGURES.

Number of trips made during week—I.L. 38, H.P. 16, D.A. 22, M.A. 25, G.E. 9, K.L. 23, S.F. 2.  
 Number of passengers carried—I.L. 62, H.P. 114, D.A. 44, M.A. 23, 22; Sunday 25th, 10.  
 Total number of trips by British machines: 78 carrying 220 passengers.  
 Total number of trips by foreign machines: 37 carrying 52 passengers.  
 Trips per day—Monday June 19th, 18; Tuesday 20th, 19; Wednesday 21st, 23; Thursday 22nd, 23; Friday 23rd, 20; Saturday 24th, 22; Sunday 25th, 10.

## STATISTICS.

Machines, 135; Passengers, 272; Crews, 193; Total Personnel, 465  
 Corresponding week last year:—  
 Machines, 105; Passengers, 381; Crews, 122; Total Personnel, 503  
 Corresponding week, 1920:—  
 Machines, 113; Passengers, 217; Crews, 122; Total Personnel, 339

## NOTES OF THE WEEK.

The Aircraft Disposal Company have had a very busy week of it. They have prepared five machines for the Brussels meeting and have also dispatched a new D.H.9 to Mac, Proume and Wilfred.

With this latter machine Capt. Stocken left Croydon for Marseilles on Thursday and flew there direct with one stop at Lyons, completing the journey in six hours and two minutes. Thus it will be seen what a good pilot unencumbered by people with a desire for publicity can really do. Capt. Stocken then hurried back to Brussels to fly an S.E.5a in the meeting there.

On Thursday Messrs. Hayns and Courtney left for Brussels on two of the red S.E.5a's for the race and the next day Mr. Hayns who came back in the night by boat and train took Capt. Stocken's S.E. over.

The same day Mr. Dickinson took a "Tinsyde" over for the same event and Major Foot left on a Bristol "Fighter."

Mr. MacIntosh left for Brussels on the newest W.8b G-EBBI on Saturday and after taking part in the events there, he flew on to Paris, the machine having won the chief event.

The three W.8b's, and the last of the o/400's, were all going hard during the week-end as Handley Page Transport had put on extra services to take passengers to the Grand Prix horse-race and back.

A new D.H.34 destined for the Instone Air Line was brought over for demonstration purposes by Mr. Alan Cobham on Friday morning to show how the machine could take off with a full load.

She had on board the equivalent of ten passengers and luggage. Owing to the high wind Mr. Cobham had some difficulty in taxiing her across the aerodrome and it was at first thought that he was practising "sky writing" on the ground, in fact some people said that they could actually read "Alan J." However he eventually straightened her up and started off.

After running along with the tail well up for about 100 yards he pulled her off at a steep angle and she took the climb well. Though one would not like to see this being made a regular habit it shows that the 34 can be pulled up over an obstacle in an emergency. The new machine whose registration prefix is BV, was afterwards flown back to Stag Lane. It is understood that she is to re-undergo Martlesham tests.

Mr. Keys was returning from Paris on Friday on the "Vulcan" against a strong head wind and when right over Tonbridge he ran out of petrol and so decided to discontinue his flight. The machine will require repairing.

Mr. Youell has now joined the Surrey Flying Services as second pilot. Last week he flew the new Renault Avro to Paris and back, averaging four hours each way including landings at St. Ingelvert for petrol.

Mr. Muir has taken the other Avro to Leighton Buzzard (Bucks) where he is giving exhibitions in connection with a fête.

In last week's notes one stated that Mr. Smirnoff the K.L.M. pilot was one of the group of Russian cadets who were being trained by the R.A.F. towards the end of the war. Mr. Smirnoff tells one however that he was never a Russian cadet in England but was in fact an officer of the Royal Air Force and was demobilised with the rank of Second Lieutenant in July 1919.

The Daimler D.H.34 G-EBBS which has been doing so much work lately covered 23,000 miles last month at an average speed of 101 m.p.h., so that she spent about 230 hours in the air. Pilots of war experience will realise what 230 flying hours in a month means. The machine has done almost that amount already this month and as yet there has

been found no "snag" in machine or engine, which speaks volumes for Daimler organisation and De Havilland and Napier workmanship.

There have been sundry very secret meetings among the representatives of British Air Lines, some of which have been attended by the Director of Civil Aviation. As the results of some of these meetings actually involve a change of time in the arrival and departure of machines of foreign firms it seems that it might have been more diplomatic to invite representatives of the said firms or at least consult them as these meetings of "masked men" as they are called naturally meet with a certain amount of very natural resentment from those thus affected.

One doubts whether such a slight is really intended, but it leaves rather a bad impression.—G. D.

## Plymouth.

The Berkshire Aviation Company have had quite successful visits to Newton Abbot and Tavistock and have now moved on to Plymouth where they are giving exhibitions from the racecourse.

On June 10 Avro G-EAKX, piloted by Mr. A. L. Robinson, of the Berkshire Aviation Co., with Messrs. Holmes and Taylor as passengers, flew from Newton Abbot to Tavistock in 24 mins. The machine passed right over H.M. Prison at Princetown—convicts could be seen exercising in the square.

Flying began on the Saturday, and the machine was kept busy throughout the week-end. Flying is a great novelty for the Devonians—it reminds one of the old pre-war days to watch the crowd—they cheer and clap when the machine "takes-off" and lands, and then rush home for their autograph books.

## York.

The Berkshire Aviation Tours have been at York for the last week, but owing to bad weather have accomplished little.

On one rainy morning, the 13th to be correct, an Air Ministry Inspector put in an appearance, and there and then placed "Oid Faithful" G-EASF *hors de combat* by suspending her airworthiness certificate. On receipt of a confirmation from the Air Ministry Messrs. Holmes, Ferrand and a mechanic left York on the alleged death trap at 05.30 o'clock for Hamney the B.A.C. H.Q., arriving there at 06.00 o'clock, after a three-quarter hour stop for breaking the fast at Loughborough. There being no spare wings at East Hamney they left at noon for Castle Bromwich reaching there at 13.00 o'clock on Monday, June 10th. There all wings, centre section, were taken off, all fittings, struts, wires, gravity tank, etc., transferred to a new set, and the whole were re-assembled at 16.00 o'clock on the 20th. What little sleep that could be had was accomplished in an old Handley Page lying in the aerodrome; a very draughty makeshift.

They left Castle Bromwich at 18.15 hours and arrived back at York at 19.30 hours on June 20th, on the whole a very creditable performance.

## Manchester.

Mr. C. D. Barnard and a de Havilland Aircraft Co's. D.H.9 (Siddle) "Puma" during Whitsun week made four flights a day from Alexandra Park Aerodrome, Manchester, to Douglas, I.O.M., carrying morning and evening newspapers, and, as one might expect, everything went off without a hitch.

Mr. Barnard wishes it to be mentioned that during his stay at the Alexandra Park Aerodrome he was treated in a truly royal manner by the Wilson Bros., and the assistance received at their hands added in no small way to the success of the venture.

## AN AUSTRIAN PIONEER IN ENGLAND.

Herr Ludwig Lohner, engineer and director of the Lohnerwerke Gesellschaft M.B.H. of Vienna, one of the pioneer aircraft manufacturing firms of Europe, has just paid a visit to England.

In the course of a call at the office of THE AEROPLANE he expressed his profound admiration of the organisation of British Civil Aviation, as exemplified by the equipment of British Aerodromes, the system of inspection and licensing of aircraft personnel, and the provision of meteorological and wireless services.

He proposed to extend his observation by making part of his return trip—as far as Paris—in a Handley Page aeroplane, which he said would be his first experience of the twin-engine type.

With regard to aviation in Austria, he said that there were no indigenous activities of any importance at the moment, and that the exploitation of routes over Austrian territory by foreign air lines had the appearance of being dictated by political considerations rather than by any hope of commercial success.

# TITANINE DOPE

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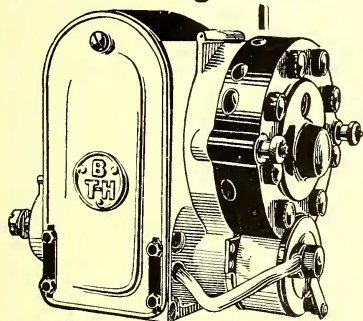
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1921—First, Second and Third Places secured in Aerial Derby.  
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B.T.H. Magnetos also helped to create the latest Speed  
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### THE TRANSATLANTIC FLIGHT.

H.M. the King, in a message addressed to the President of the Portuguese Republic, with reference to the flight from Portugal to Brazil on Fairey (Rolls-Royce) seaplanes, said:—

"Please accept my warm congratulations and those of my people on the successful issue of the daring enterprise of Portuguese aviators in their memorable flight to South America. This great achievement, which commands the admiration of the world, is worthy of the Portuguese nation and adds further lustre to its annals."

### MAC, BROOME AND WILFRED-VI.

MY DEAR PILOTS AND GROUND WALLAHS,—

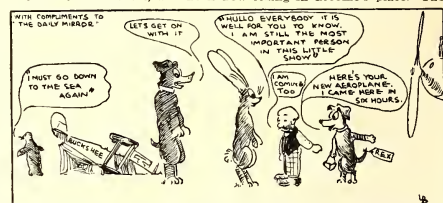
You will be delighted as the Marseillais to hear that Mac, Broome and Wilfred have at last left Marseilles with their thoughts once again full of visions of "S'Mac S'Broome and S'Wilfred."

They got tired of their old aeroplane which would stand on its head, and also there was a very serious shortage of carrots and lettuce in France. So they sent a wire to a little friend of theirs called Rex to bring them a new aeroplane. So Rex brought one out to them on Thursday. Wilfred was rather peeved to think that it only took Rex six hours to do what it had taken him a month to do.

All this time Broome was longing for his Alentian Islands and as they were so long at Marseilles Broome walked on ahead by himself to see whether the Islands are still there and to plant some carrots

and lettuce and to buy them some petrol, as they have decided that the aeroplane will work better if they have some petrol there.

So Wilfred found another little friend called Geoffrey Malins, whom they call Jeff for short, and he is now riding in Broome's place. They



say that when they leave America on the last lap they will have a bigger aeroplane and Broome will fly home with them.

Meanwhile they have flown on to Brindisi which is 600 miles further on. They took a day over this in spite of the fact that little Rex showed them that he could do 700 miles in six hours. But anyway they are now at Brindisi so there we will leave them hoping that they will get on a bit by next week.

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From "The Times," June 23rd, 1922.

### Flying Officer Killed at Northolt.

While engaged in a practice flight at Northolt yesterday preparatory to taking part in the Air Pageant at Hendon tomorrow, an aeroplane of the Snipe scout type, piloted by Flight-Lieutenant K. McClintock, M.C., collapsed and fell to the ground in flames from a considerable height. Lieutenant McClintock, who had a distinguished war career, was killed.

On March 8th, 1920, in response to a question in the House of Commons by Brigadier-General SURTEES, who asked:—

"If Parachutes are now being fitted as standard to Army machines in order to protect pilots as much as possible from the dangers of fire, collapse and collision in the Air"

Major TRYON, replying for the Secretary of State for Air, said,

"The work in connection with the modification of existing types of fighting machines to enable Parachutes to be carried is being proceeded with, but some time must elapse before all existing machines are modified in this direction."

On May 17th, 1922, the Secretary of State for Air, replying in the House of Commons to Sir WILLIAM JOYNSON HICKS, said,

"There are no fighting aeroplanes at present fitted with Parachutes."

Mr. Calthrop's detailed plans for Cabin "Soaring Type" Parachutes, which permit the conversion of Civilian aeroplanes within a few minutes to war purposes, were submitted confidentially to the Air Ministry on February 18th, 1921, without any result but a formal acknowledgment.

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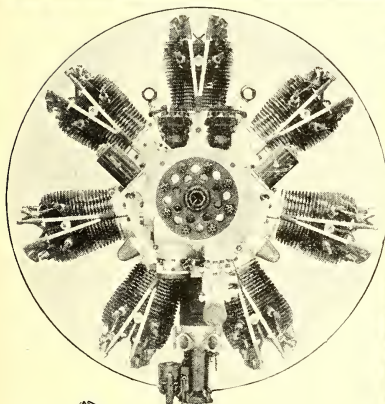
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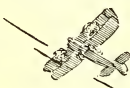
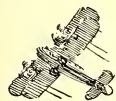
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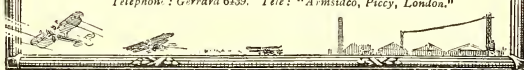
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De Havilland Aircraft Co., Ltd., The Stag Lane Aerodrome, Edgware, "Haviland," Edgware. Kingsbury 1607-15 (lines) .....	471
Fairley Aviation Co., Ltd., The Hayes, Middlesex "Airly," Hayes, Middlesex. Hayes, Middlesex 47 .....	457
Gloucestershire Aircraft Co., Ltd., The Sunningend Works, Cheltenham. "Sunningend," Cheltenham .....	466 & 467
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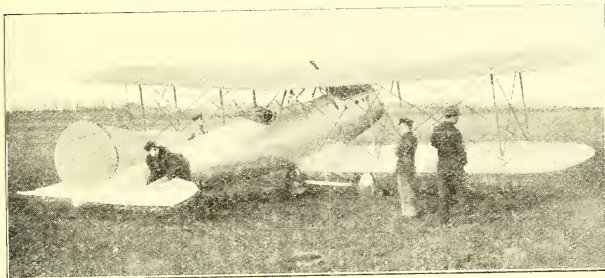
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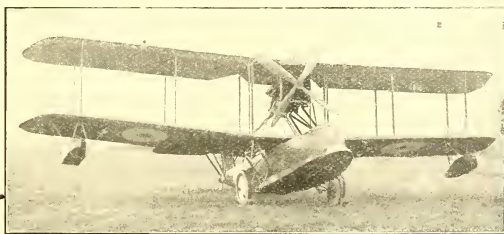
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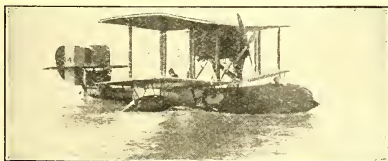
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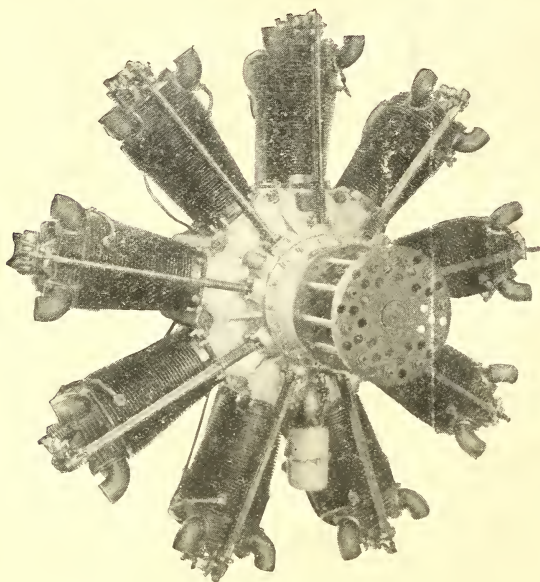
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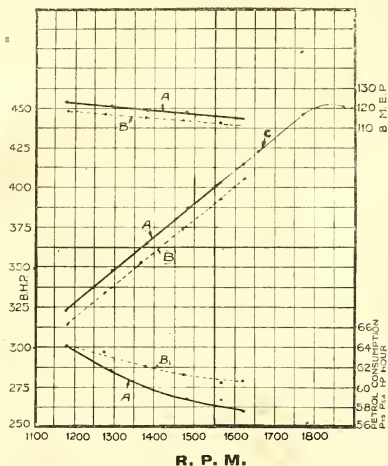
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